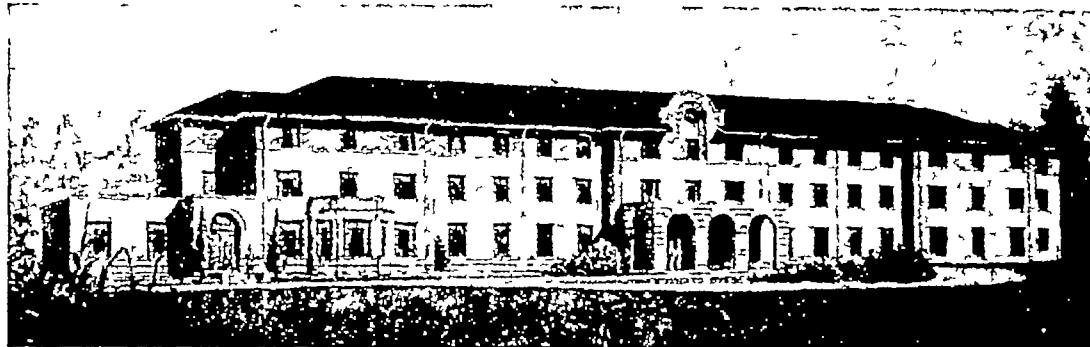


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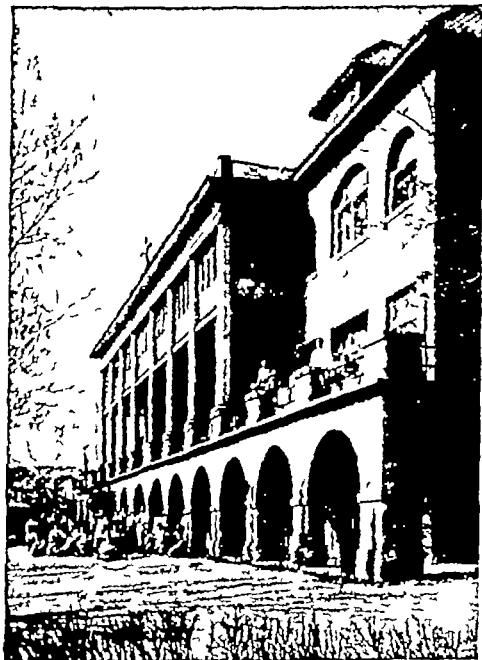
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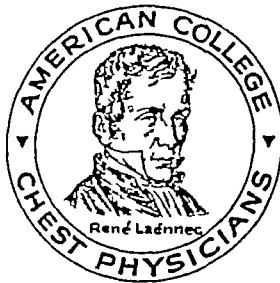
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OF THE

CHEST

Official Organ of the Amer College of Chest Physicians
 Editorial offices 1018 Mills Building, El Paso, Texas
 Business Address P O Box 1069, El Paso, Texas
 MEMBER ASSOCIATED EDITORS OF TUBERCULOSIS PUBLICATIONS



(A MONTHLY PUBLICATION)

Subscription United States and
 Canada \$2.00 per year Other
 countries \$2.50 per year
 Entered as second-class matter
 August 18, 1936 at the post office
 at El Paso, Texas, under the Act
 of August 24, 1912.

Editorial Comment

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**EDUCATION
 IN TUBERCULOSIS**
 ●

With the advent of December, when we think of tuberculosis we think of the educational program of the National Tuberculosis Association made possible by the annual

seal sale. This educational program for thirty-two years has carried to the laymen the story of tuberculosis, the contagion, and how to prevent it. Education of the public in tuberculosis has done a great deal towards reducing the death rate from tuberculosis in the United States from first to seventh place.

There is much for the medical profession to ponder over when we consider education in tuberculosis. When the National Tuberculosis Association and its component socie-

ties carry to the public an educational curriculum in tuberculosis, it is in fact an admission that the medical profession has been unable to adequately cope with the tuberculosis problem and that the people, themselves, must be trained and counseled in such known processes as may tend to reduce the incidence of this great infection. The education of the public has proved inadequate to meet the tuberculosis problem. More education is necessary if we are to reduce this major infection from its present stronghold.

It would seem that the education of the future should not only be the education of the layman but of the physicians themselves. And it is not necessary that physicians be educated in some new discovery but rather that there be assembled and correlated the present classical facts that we have actually in our possession today, but facts that we are not utilizing to the fullest degree possible for the professional management of this disease.

There are two groups of us that should be educated in tuberculosis. The first group is composed of bedside physicians, those general practitioners and internists who are called to the acute case. It is known to the profession that the tubercle bacillus may be responsible for the acute pulmonary illness, most frequently diagnosed as broncho-pneumonia. How many physicians are tuberculosis cons-



cious to the degree that when they are called to the bedside of an acute pulmonary illness that they have in mind the causative factor might be the tubercle bacillus? How many physicians have their patient x-rayed six weeks following the "broncho-pneumonia" or "influenza" because they realize that the acute illness might have been due to the tubercle bacillus? The case should be investigated weeks later to ascertain whether or not resolution has occurred. What a great contribution it would be towards the tuberculosis problem if the educational program carried to the bedside doctors of the United States, would result in tuberculosis consciousness for the attempted diagnosis of the acute pulmonary case which presents itself.

The other great group of physicians who need education are those physicians who treat pulmonary tuberculosis. These physicians know the value of hospitalization, the value of bedrest together with other hygienic measures, they are versed in the various methods of pulmonary compression, but they have insufficiently correlated their methods of treatment and regimented them, if you please, to that state where they are living under the slogan "Open tuberculosis must be closed."

Again it is a case of carrying to a group of physicians facts already known to us, but when correlated, lead us to a state of consciousness that when we have an open case of pulmonary tuberculosis present, that our entire effort should be to close it.

Our imagination might carry us to great heights if we thought of the results that could be obtained if the bedside physician made a truly early diagnosis of tuberculosis in its truly first clinical stage. And then our imagination would carry us into the realm of the millennium when we think of the results that would be obtained towards the control of this infection if all of our men treating tuberculosis operated under the slogan that "Open Tuberculosis Must Be Closed." And to accomplish these two great results we need no new information. We have adequate proven facts to accomplish both of these ends, if we will but disseminate them properly to those two great groups of our profession.

So as the National Tuberculosis Association launches its drive for education of the public

in tuberculosis for 1939, it should be the responsibility of every physician not only to aid in the Christmas Seal Campaign, but to take an active lead in the formulation of policies which have to do with this important problem. If physicians are to direct medical programs, they must accept the responsibilities which accompany a position of authority. Unless they are willing to do this, it is expected that lay groups will assume the lead. May 1939 bring more education in tuberculosis, not only to the public but to the physicians themselves.

O E E

ASPIRATION Today, anyone engaged in pneumothorax therapy, has frequent occasion to aspirate fluid from the pleural cavity. In large clinics or hospitals, and in the extensive private practice of many chest specialists, it becomes almost a part of the daily routine. Every pneumothoracist has occasionally, if not frequently, encountered cases where the chest presented something of a physical and optical illusion. After viewing the chest externally, augmented by the physical examination, the needle is inserted in what appears to be the usual orthodox basal position. A "dry" tap results and is very disconcerting to both the patient and operator. Fluid is known to be present, for just a few minutes ago it was easily seen under the fluoroscope, perhaps one-third to one-half a chest being filled. If the patient is now placed again behind the fluoroscopic screen and a marker placed over the point of puncture, it will be seen that the needle was introduced from one to several inches away from the fluid, usually below it. Not uncommonly, a collection of fluid in the lower half of the pleural cavity will be revealed, following orientation by the fluoroscope, to have its base, when projected to the external chest wall, in the region of the axilla.

For these reasons the writer has developed in his office practice a simple method of fluoroscopic orientation which has aided him greatly in overcoming some of these difficulties in aspiration. A small section of metal chain, such as may be cut from a metal leash purchased at the ten cent store, is used. The ends of this piece of chain are provided with

tabs of adhesive tape Under fluoroscopic vision, the chain is placed around the chest at the lower level of the fluid, and held in place by the adhesive tabs If desired, one may be placed about the upper level as well The patient is then removed to the room wherein the aspiration is to be performed—the chain removed, and appropriate markings with tincture of iodine made If no chain is to be conveniently had, then a silver coin held tangentially to the chest wall and then turned flush against the chest and taped on, makes a good substitute By this very simple procedure, the fluid levels in the chest are very accurately determined and projected externally to the skin surface In selecting the site for the thoracentesis puncture, an area on this level just determined, should be one that is flat to percussion The fluid does not always lie completely free in the pleural cavity, even though appearing so on fluoroscopic examination The lung may be adherent at different sectors of the hemi-thorax By this simple technique, the writer has about eliminated dry taps in his own practice, and with them, the embarrassment of not getting what he went after when he knew (and so did the patient) that it was there This method also enables the operator to make the puncture at the lowest safe level, and thus to remove the greatest possible amount of fluid By manipulating the patient's position on the table, at times employing a marked backward tilting one, this latter objective is considerably abetted

C H H

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Let me give you an example of error on our part We had in our state a county in which a certain piece of public health work needed to be done—a tuberculosis survey The survey would have sent a large number of patients, through tuberculosis cases being found in need of treatment, to family doctors, x-ray, and chest specialists The County Medical Society blocked the work because they were not willing to have an "outside" organization come in, although they themselves were not equipped to compete for the work So they and their public lost they, money, and the public, health Had they been guided by what was best for the public, the mistaken position would never have been taken If their community had retaliated and told the doctors that they could only purchase home products, the doctors would have been outraged

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Case Finding under the Pennsylvania Plan and the Attitude of the National Tuberculosis Association toward the Plan*

ESMOND R LONG, M.D

Philadelphia Pennsylvania

THE PRINCIPLES of tuberculosis case finding are the same under all plans and are based on the discovery of the maximum number of cases possible with the funds available. In general, two methods are applied the examination of tuberculosis contacts and mass surveys for the discovery of the disease.

It may be argued that undue emphasis is being placed upon tuberculosis in the prospective public health program of this country, particularly in view of its rapid decline as a cause of death. It is indeed true that an enormous drop has taken place in the total mortality from this disease. Enthusiasts point with pride to its present low level, sixth among the listed causes of death. But the fact is commonly overlooked that the causes of mortality listed above it, viz., heart disease, cancer, nephritis, cerebral hemorrhage and thrombosis and finally pneumonia, are not specific disease entities, as is pulmonary tuberculosis, but rather agglomerations of ailments lumped together for statistical convenience. If heart disease, the various forms of cancer, the different diseases of the kidney called "nephritis" and the different types of pneumonia were correctly reported and separated according to the best modern classification, and the fatal cerebral vascular events assigned to their own specific causes, pulmonary tuberculosis would probably still hold first place as a specific disease causing death.

The essence of the Pennsylvania Plan, as clearly expressed by Dr Frank Burge in a recent number of the *Weekly Roster* of the Philadelphia County Medical Society (June 18, 1938), is a coordination of antituberculosis forces through the medium of a series of committees in organized medicine. Referring to the antituberculosis campaign up to date

and, particularly, to the part played by voluntary agencies Dr Burge wrote "It (the National Tuberculosis Association) has been doing a great job, in spite of unorganized opposition or indifference on the part of organized medicine." In brief and in essence the Pennsylvania Plan is to replace the indifference and even occasional obstruction to which Dr Burge has frankly and courageously referred with active effort by organized medicine in the antituberculosis campaign.

The opportunity is exceptional, as organized medicine is in a position to attack tuberculosis in certain fields where the voluntary agencies are helpless. Since the larger part of advanced tuberculosis is still discovered by the private physician, the latter is first on the ground for the examination of contacts. Organized medicine, under the Pennsylvania Plan, particularly in cooperation with the state, can do much for the fight against tuberculosis by stimulating a keen sense of responsibility on the part of physicians. Education in responsibility as well as technic is presumably included in the educational program of the plan. There is much that is worthy of emulation in the well known plans of other states and cities, where the private physician is virtually a health officer in his dual relation of responsibility to the tuberculous patient's family and to the state.

It is, however, in the field of mass surveys that the opportunities under the Pennsylvania Plan are maximum, for it is in this very field that the indifference and opposition previously operative have largely prevented effective work. In the past, with few notable exceptions, surveys have been confined to school groups, groups in which it is now well recognized that the incidence of tuberculosis is low. The majority of tuberculosis occurs in adult life. It is most easily detected, in those symptomless early stages

* Abstract of paper presented at a Tuberculosis Dinner held Oct. 6 1938 in connection with the Annual meeting of the Pennsylvania State Medical Society

when the prospect for rapid arrest is good, through mass surveys in industry. Admittedly, medical practice of this sort is in a state of controversy. The fact remains that the experience of city and state health departments has shown abundantly that large numbers of early cases can quickly and inexpensively be found through surveys of adult industrial groups. If organized medicine will depart somewhat from old tradition and assume leadership, rather than set obstacles in the way, in this field, it can be responsible for a vastly improved national program of tuberculous case-finding. The problem is difficult, because in addition to its medical aspects it involves the economic interests of employers and employees. But it seems clear that unless the program is frankly taken over by the state, only organized medicine can bring about the desired and achievable success.

As to the second phase of the subject, I

am in no position to speak officially for the National Tuberculosis Association. Yet I am acquainted with its aims, and have no hesitancy in saying that it can only look with approval on any plan, such as the Pennsylvania Plan, in which the coordination of antituberculosis forces is a primary object. One only needs to recall the emphasis laid by the first president of the National Tuberculosis Association on coordination in his address at the first annual meeting, an emphasis which, as far as I know, has never changed. Trudeau spoke then in his moving way of "an organization so perfect and a cooperation so broad that through education it will bind together for the attainment of a common aim the laity, the profession, the state and the nation." It seems to me that in this simple statement, which characterizes the attitude of the National Association today, there is abundant endorsement of the principle of cooperation that is intrinsic in the Pennsylvania Plan.

Tuberculosis in General Practice*

JOHN H PECK, M.D., FACP
Oakdale Iowa

DR JOHN H PECK Mr Chairman, Ladies
and Gentlemen

We should bear in mind, Mr Chairman, that as the introducer of this subject, I have the privilege of asking questions, which the discussors must answer. I consider it a rare privilege to discuss mutual problems in tuberculosis with an understanding and sympathetic audience, because so many times in discussing certain phases of tuberculosis we feel that we must evade certain evident facts in order to please every one in our audience group.

The title, *Tuberculosis in General Practice*, might have been somewhat more descriptive. After all, what is the difference between tuberculosis in general practice and in private practice, in hospital practice and in sana-

torium practice, in consultant practice and in public health work. Obviously, the same general principles must prevail wherever and however the subject is considered.

We infer that the general practitioner has the opportunity to see the suspected tuberculous patient first. Therefore, it is clearly his responsibility to recognize the disease as early as possible, that is, to make an accurate diagnosis from such evidence as is obtainable or else to refer the patient where better diagnostic facilities are available. To my mind, a consideration of the available data according to the simple case analysis method as advocated by the late Lawrason Brown will reveal a remarkable uniformity of correct diagnoses.

But let us not be guilty of assuming that management of the tuberculous patient is a simple proposition. It deserves the very highest medical skill. The too frequent advice to rest, drink milk, and trust in the Lord is unworthy of the general practitioner. It is

* Read before the Fourth Annual Meeting of the American College of Chest Physicians, San Francisco, California, June 12 1938

**Medical Director, Iowa State Tuberculosis Sanatorium

striking inconsistency that we have advocated and built more than 80,000 beds exclusively for tuberculous patients and yet have failed to provide a sufficient number of adequately trained physicians, especially from the standpoint of ability, to select those patients who are most likely to profit by sanatorium care and training

I wonder if physicians realize, generally, that the three phases of the tuberculosis problem from the medical standpoint, are almost equally important. These phases are diagnosis, treatment and after-care. Some ten or eleven years ago, the National Tuberculosis Association introduced a form of propaganda, known as the early diagnosis campaign. This was directed chiefly to the laity in an effort to stimulate and encourage a more general tuberculosis consciousness. Much interest was aroused, but certain inherent difficulties became evident. That first slogan, after mentioning several suggestive symptoms, enunciated the edict "Let your doctor decide." Excellent advice—this appealed to the medical profession, including our left handed brethren, and they were tremendously pleased to think that a great voluntary health agency was actively engaged in drumming up business for the doctor. In other words, the National Tuberculosis Association publically declared that any doctor, no matter what variety, was perfectly capable of arriving at a correct and reliable opinion regarding the presence or absence of pulmonary tuberculosis in any given case. Whereas, the majority had neither the scientific knowledge nor the professional skill to recognize early pulmonary tuberculosis when it was early. Unfortunately, many practitioners did not admit the truth of this, but experience testifies to the fact.

Many similar slogans have been launched since. One of the most effective is the "Early Discovery, Early Recovery" slogan. This suggests to the prospective tuberculous patient that every doctor, and particularly *his* doctor is thoroughly qualified to be an honest discoverer and capable of pointing out the straight and narrow road to early recovery. This was too much to ask of the conscientious doctor. He did the best he could, according to his knowledge, but his lack of training in the essentials necessary for the diagnosis

of tuberculosis naturally led to many errors of commission as well as omission. The latter is only slightly more dangerous than the former.

On numerous occasions, honest physicians have confessed to me that they know practically nothing about pulmonary tuberculosis, do not know how to obtain a proper history, cannot elicit and interpret abnormal physical sounds in the chest, do not know how to interpret the chest film. A positive diagnosis by such practitioners is made solely upon a report of "tubercle bacilli found," usually from the state laboratory. This really is a pitiful situation, but it redounds to the credit of the physician that he is willing to admit the alleged fact. Now what is the solution?

First, we must agree that medical schools should revise their curricula so that proper and sufficient time be devoted to modern teaching of this most important subject—pulmonary tuberculosis. This means that a physician thoroughly grounded in the fundamentals of the recent knowledge of tuberculosis, and with a definite flair for teaching, be selected to direct such a division, and then provided with abundant clinic material, adequate equipment and sufficient time. Young graduates will then be turned out qualified to do their duty to the public along this line.

We have a fortunate situation in Iowa, where the state sanatorium of 420 beds is located only four miles from the State University College of Medicine. The staff members at the sanatorium have medical faculty appointments and are actively engaged in practical clinical teaching. During their sophomore year, the students are instructed in the essentials of physical diagnosis of the chest by class work and group demonstrations. This fundamental instruction is very necessary, unless, as some men apparently advise, physical examination of the chest be abandoned altogether. Personally, I cannot agree that other methods, particularly the x-ray, shall entirely supplant the pioneer work of auscultation dating from Laennec more than 100 years ago. During the junior year, didactic lectures on tuberculosis should be conducted by a physician from the sanatorium, instead of by one whose chief interest lies in hearts, kidneys, goitres, or something else. An adequate number of hours

should be set aside for this instruction

It is most important that during the senior year the student's knowledge be correlated and systematized so that it may be useful for his future practice. This is best accomplished by a definite period of residence in the sanatorium, with a carefully planned schedule including lectures, demonstrations, laboratory procedures, modern methods of treatment, and many other phases of tuberculosis.

At the Iowa State Sanatorium, we provide housing for groups of five or six students for two consecutive weeks, where they devote about 90 hours to concentrated consideration of this subject. Each student examines at least 25 patients under supervision, and his work is thoroughly checked. The students appreciate this course, judging from the number of favorable comments.

Post-graduate instruction in tuberculosis presents a much more difficult problem. Evaluation of alleged results leads to conflicting opinions. For 20 years, the Iowa Tuberculosis Association conducted chest clinics over the state upon invitation of county medical societies. Having conducted most of them, I believe these clinics served a useful purpose, not that so many primary diagnoses were made, but that every patient furnished clinical material for discussion of various diagnostic points. A luncheon or dinner meeting gave an opportunity for a formal paper on some phase of pulmonary tuberculosis, usually with a lantern slide or movie demonstration. It is interesting to note that many county societies requested annual clinics and made them an outstanding feature of this part of the program. In fact, there are county societies that apparently never had a meeting except when they had a tuberculosis clinic.

Later on, mass tuberculin testing of school children became a popular variation, serving to emphasize the specificity of the reaction, and the importance of obtaining chest x-ray films of reactors. There is distinct value in this procedure, but it is essential that the significance of a positive reaction be thoroughly understood. Lack of this understanding sometimes creates unnecessary concern. A majority of the doctors required education to the end that proper care was instituted.

These surveys, however, we found rather expensive and very time consuming.

The Speaker's Bureau of the Iowa State Medical Society has put on some tuberculosis programs. These are not always popular, as the average medical audience has become somewhat blasé about tuberculosis, and doesn't care to be told much about it. Some of them, like an old doctor in a certain Iowa county came back at us like this "What do we care about tuberculosis? There aint been a case in my county in seventeen years." Obviously, he was mistaken, but his belief was significant.

After the mass testing programs, the next step naturally indicated was concentration on the search for pulmonary tuberculosis among known contacts. This method discovers a much higher percentage of cases, particularly by use of x-ray films, and, when associated with the official demand for examination of all members of tuberculous families, accomplishes much good. Doubtless, this procedure will stand the test of time and become a distinct part of every official program against tuberculosis.

In the past year, there have been correlated cooperative surveys to discover cases of tuberculosis. The Iowa Tuberculosis Association and the State Department of Health put their money together and got a little help from Washington in putting on this kind of a program—the examination of contacts, which should be very successful.

Now, having presumably made the general practitioner proficient in the diagnosis of pulmonary tuberculosis, it appears essential that he be instructed in the modern methods of treatment. He has abandoned, in most instances, the old fashioned attempts at home treatment, but he still needs to display the courage to insist upon prompt and aggressive sanatorium care.

The medical profession in general lacks knowledge of the tremendous strides made in chest surgery during the past decade, enforcing much desired mechanical rest. But another thing the doctor in general doesn't realize is the *time* element in getting well. This is very important. Several weeks ago, my medical social worker told me that she believed if I could see Mrs. Blank I could persuade her to stay (she had been in the

institution a very short time) I asked if everybody else had exhausted themselves She said they had, and it was up to me—the last call I told her I never yet had succeeded where everybody else had failed, but I went to see the lady, and asked her what was the rush about getting home She answered

"It's almost the first of June and my doctor said that if I went to Oakdale I could come home by the first of June, so I'm going back"

"All right," I answered, "Goodbye" I learned long ago that you can't argue with patients and have any degree of success

Now the third phase, the unfinished task in tuberculosis, means a greater appreciation of the value of proper after care Too many physicians think the discharged patient is a finished product They do not realize that the patient requires medical supervision for many years Even the advice always given a departing patient and written to his doctor that supervision and routine examinations are absolutely necessary is frequently disregarded It is a most curious anomaly that a patient who has spent several years in a sanatorium, and hence should have reliable information regarding tuberculosis neglects the most important phase of all, that is, to insist upon competent medical supervision after discharge I am not sure how this can be solved We have devoted much time to diagnosis, considerable time to treatment, and our next job is to concentrate on educating first ourselves and then our patients concerning the admitted value of after care, not alone for the preservation of life, but because of the huge financial outlay in getting the patient back on his feet

It is perfectly obvious, then, in conclusion, that until the physician in general practice has more adequate training in tuberculosis diagnosis, a more modern conception of treatment during and after a sanatorium residence, we shall have late diagnoses, deferred treatment, and unnecessarily bad results for the tuberculous patient

DISCUSSION

DR J M ODELL
The Dalles Oregon

I wish to compliment Dr Peck on his pre-

sentation of the problems which we have to confront and remedy if we are to make the desired progress in the diagnosis and treatment of pulmonary tuberculosis

Until a few years ago, general practitioners in Eastern Oregon, as a rule, showed an apathetic attitude towards the diagnosis of tuberculosis and especially the treatment Many of these general men seldom had a chance to see an x-ray of a tuberculous lung, or to listen to the physical findings associated with tuberculosis, and, considering these facts, it is not to be wondered at that many cases were not diagnosed, even had the patient had a thorough chest examination, which was not often the case, as these general practitioners had little time to give to each patient Had they been familiar with the signs and symptoms of tuberculosis, they would perhaps have given more time to the chest examination

A great majority of cases which were received from Eastern Oregon at that time were far advanced and nothing much could be done for them after admittance Due to lack of funds, many counties were unable to carry on a county health program A few counties who did carry on this program became interested in tuberculosis to such an extent that clinics were requested for the tuberculin testing of all school children, and from these clinics increased interest began to be evident among the laity and physicians

Needless to mention, in the last three years there has been a decided decrease in the number of far advanced cases seeking admittance Many cases are now sent in with a tentative diagnosis of pulmonary tuberculosis which often, after a period of observation, turns out to be non-tuberculous However, it is far better to have many cases sent in for observation than to let one case be neglected

It is interesting to note that in one county two high school children were diagnosed as actively tuberculous in an early stage and their general health at the time of the diagnosis was excellent In another county, where the teachers took the tuberculin test, two were discovered to have active tuberculosis One had been teaching school for eight months after having had a hemorrhage Another teacher had been teaching for a year after

having had a hemorrhage and, at the time her disease was discovered, had a laryngeal, pulmonary and intestinal tuberculosis These are just a few instances of active cases which have been discovered by tuberculin testing in high schools

In Eastern Oregon the local physicians are urged to take an interest in the tuberculin clinics and as a result many of them are now carrying on clinics alone in their own counties

The positive reactors are either sent to the state hospital for a fluoroscopic examination, or, if too far away, an x-ray is taken and sent to a competent tuberculosis specialist for interpretation The general practitioners in this part of the state at this time, once tuberculosis is diagnosed, immediately advise the patient to seek admittance to one of the two state sanatoriums They have come to realize that the treatment of tuberculosis outside of a sanatorium is inadequate and in many cases the physicians wish to be relieved of the responsibility of treating a long, drawn out, chronic case such as pulmonary tuberculosis

I believe that tuberculin testing in Eastern Oregon has done more to make the general practitioner and general public tuberculosis minded than any one other factor True, there is some objection to tuberculin testing as done here, as in many cases those who have positive tuberculins have not been properly informed as to the significance of the test However, one has to choose between two evils, that of unduly alarming a positive reactor, or discontinuing the tuberculin clinics Even though some of the positive reactors are unduly alarmed, when they have been assured that a positive reaction does not necessarily mean that they have tuberculosis, and after an examination when they are informed that they do not have this disease, these people do more to spread the gospel than any number of nurses

DR RALPH C MATSON
Portland Oregon

Mr Chairman, Ladies and Gentlemen I agree that the so-called "Early Diagnosis Campaign" of the National Tuberculosis Association has not resulted in bringing patients

with less advanced disease to the specialist As a matter of fact, the slogans "Let Your Doctor Decide" and "Early Discovery—Early Recovery" of the National Tuberculosis Association, as Dr Peck says, were evidence of a very pleasing and flattering attitude on the part of the National Tuberculosis Association toward the medical profession, and particularly, as he says, our left-handed brethren They were naturally tremendously pleased to feel that a great health agency regarded them as not only qualified to diagnose tuberculosis, but to treat it Whereas, as Dr Peck states, the vast majority of the members of our profession have neither the training nor the knowledge to diagnose tuberculosis or properly treat it

The medical profession was truly honest enough This program was, as it were, virtually shoved down their throats and they more or less had to accept it My experience has been that on innumerable occasions honest physicians have had to fit into the picture intimated by the slogans just mentioned Their patients had been through clinics and were referred back to them with the report that the individual had tuberculosis Thus, many physicians found themselves wholly at a loss to know what to do because of their lack of knowledge of tuberculosis

The situation, especially the diagnosis of tuberculosis, is really pathetic, but, fortunately, not hopeless, because the profession realizes its lack of training and is manifesting increased interest in the diagnosis and treatment of tuberculosis There is no doubt that the methods of teaching physical diagnosis and tuberculosis in medical schools is responsible for this lack of knowledge on the part of the general profession This situation was brought very acutely to my attention by my war experience As Chief Medical Examiner at Camp Lewis, I had 120,000 men pass through my hands into service, and 77,000 of that number passed through my hands, after the Armistice, for discharge I had a group of some 40 officers on my examining board Their ignorance regarding the diagnosis of tuberculosis was appalling—so much so that it was necessary to keep a constant check with x-rays and unofficial examination forms in order to make sure that tuberculosis was diagnosed when it existed and not diagnosed

* President elect, American College of Chest Physicians, Medical Director, Portland Open Air Sanatorium

when it did not exist Later, as Chief of the Medical Staff at General Hospital No 21 (later Fitzsimons General Hospital) I was struck by the enormous number of patients in the hospital who had been diagnosed as tuberculous, but in whom, after careful study of the case, there was no justifiable evidence of the disease

After sending controls through the clinic and comparing the various physical examinations made by different groups of officers, it was very apparent that many of the doctors did not recognize or know how to interpret what they percussed or heard We sent them over to the department of music to have their ears tested on tone interpretation There were very few who had a musical sense sufficient to determine the difference between a major and minor on the piano scale, and yet they were presuming to render opinions on pitch interpretation dealing with vibrations thousands of times faster than that of the piano

Doctors see to it that their vision is corrected, if it is defective, but little thought has been given to medical students' and doctors' ears They are taught about pitch and tone interpretation in classes, without the faintest idea what it is all about I think the time will come when those students who have had no musical training will be compelled to know the fundamentals of it at least The value of this was brought very strikingly home to me on my second trip to Europe many years ago, where a symposium on tuberculosis was given at the Academy of Medicine in Dusseldorf, Germany It was a splendid symposium which lasted some six weeks and the teachers were brought from all over Europe One of the things which the class had to do was to go to the Department of Music and go through a course of exercises on tone interpretation The value of this training is something I have never forgotten

Speaking of clinics, one must admit that the average diagnostic clinic is not of very much service I have repeatedly held clinics examining from 60 to 90 patients in a day, where the x-ray films and history of the cases clearly indicated that there was no occasion for their being dragged into a clinic I recall one clinic at Astoria, Oregon a number of years ago, where some 75 husky fisher-

men, with calloused hands, were brought to me for examination An ambitious public health nurse had invited them to the clinic Every Norwegian, Swede or Finn who had a pain in his chest with cough or expectoration was there In the entire group there was only one case of tuberculosis He was very far advanced and had been earlier diagnosed by a local doctor

There can be no question about the value of tuberculin testing in families and among those exposed to tuberculosis, and x-raying the positive reactors and keeping them under observation I feel very confident that the American College of Chest Physicians will be able to work out some sort of a program which will be of value to the general practitioner

DR CHESLEY BUSH
Livermore California*

Mr Chairman, Ladies and Gentlemen We all agree with Dr Peck, Dr Odell, Dr Matson and the others, that the general practitioner enters into the problem of almost every case of tuberculosis somewhere, and we all agree that the general practitioner in many instances fails to do his part of the job I want to stand up for the general practitioner and say that this is not always his fault We have listened this afternoon to an account of tuberculosis work that is so new that some of it is astonishing even to us, and so we cannot expect the general practitioner to keep up with the progress of tuberculosis work, if we have difficulty in doing so ourselves The National Tuberculosis Association, in its educational programs in the control of tuberculosis, has to a large extent failed to realize this situation

It has assumed that the general practitioner of medicine is conversant with all the problems of tuberculosis It seems to me that this association and the National Tuberculosis Association should devise programs of tuberculosis control beginning with the medical profession and focus more attention on helping the general practitioner keep up with the modern aspects of tuberculosis

One thing that we apparently have to combat is indifference Several days ago I had the opportunity of talking with one of the

* President, National Tuberculosis Association, Medical Director, Arroyo Sanatorium

men in the central office of the A M A He told me that in states where the medical associations had postgraduate programs the lectures on tuberculosis were practically never requested We have found this true in California Local medical societies seldom request tuberculosis programs, unless stimulated to do so by the local tuberculosis organizations

Tuberculin case finding programs are a potent factor in stimulating interest in local medical associations Those of us who have graduated from medical schools more than fifteen years are in the position of having been taught that the tuberculin was an unnecessary test, because we all had more or less tuberculosis Five years ago in a city within less than twenty miles of San Francisco, with a population of 15,000 people and something more than 18 doctors, there was no physician who was able, or had even thought of giving tuberculin tests under any circumstances Our tuberculosis associations went into this community with case finding programs and placed in the hands of these physicians the problems of tuberculin testing their communities The result has been that tuberculin testing is now quite a common procedure used by the majority of the doctors in their communities and in their own private work The California Tuberculosis Association has been able to combat this indifference and lack of knowledge and has used as its principal policy the case finding program among school children in rural communities, for the purpose of achieving the cooperation and thereby the better education of the local medical group concerned

Dr Peck mentioned better education in medical schools regarding tuberculosis We have seen internes from medical schools all over the United States, and it is true the es-

entials and important details of tuberculosis are usually missed in the vast amount of general knowledge that has been brought to them How much tuberculosis should be taught in medical schools is a problem that should be worked out by a group of medical educators Possibly, tuberculosis will have to be learned during interne years to a great extent Another problem of the general practitioner is the difficulty of having all members of a family, contact to a known case of tuberculosis, come into his office for examination Naturally, if the doctor requests the patient to send all other members of his family in for examination, he is suspected of making work for himself, and is sometimes placed in an embarrassing position Assistance should be given him by the public health department and tuberculosis organizations, so that he may have at his elbow the services of a public health nurse or a social worker to assist him in this regard There should be some way in every community of rendering this assistance

Dr Becker told us at noon that the City of San Francisco furnishes laboratory work and an x-ray for any physician who feels that his patient is unable to pay for them, and in Alameda County that this thing is done by the tuberculosis association

In conclusion, I should like to add that when we blame the general practitioner we are accusing ourselves The majority of his difficulties are due to our lack of help Tuberculosis organizations must realize that the general practitioner is in the front line trenches of all tuberculosis control programs, and that we must give him all modern equipment and support and keep him informed of every new development



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The Value of Clinical Research in Tuberculosis*

ANDREW L BANYAI, M.D **
Wauwatosa Wisconsin

THERE is no doubt in my mind that all tuberculosis specialists engaged in sanatorium practice have a sincere desire to find and apply better means and ways in the treatment of tuberculosis. Unfortunately, the time of most of us is so fully taken up with the daily routine that little or no opportunity remains to record unusual observations and new ideas that are of genuine research value and would represent valuable contributions to the advancement of medical science.

One could speak at great length on the academic aspects, the psychological significance, or the didactic value of clinical research. I feel, however, that instead of taking up the theoretical aspects of this problem, I should present to you some of its practical aspects. For this reason, I wish to mention a few instances from my own experience that may have something to do with clinical research.

A possibility of finding new pathways for research is the transference of incidental clinical events into the field of treatment. It is well known that the observations on the beneficial effects of massive pleurisy with effusion upon pulmonary tuberculosis, and that of spontaneous pneumothorax upon pulmonary hemorrhage led to the introduction of artificial pneumothorax. The realization of the idea that artificial pneumoperitoneum is of value in the treatment of pulmonary tuberculosis was forced upon me by a technical error, when in one of our patients air was injected into the peritoneal cavity instead of the intrapleural space. Since the time of this accident, 1931, this treatment has been in use at Muirdale. I had the opportunity to demonstrate by roentgenologic measurements

that the injection of moderate amounts of air (500 - 1500 cc), at regular intervals causes a sustained elevation of the diaphragm. It is also demonstrable that it is followed by a substantial decrease in the apico-basal diameter, and the volume of the lung.

These changes improve the elimination of mucopurulent, inflammatory products from the respiratory tract, induce a lymph stasis and a relative passive hyperemia in the relaxed lung tissue, and aid the evacuation and obliteration of cavities. The train of events consequent to this treatment is very similar to that which follows artificial pneumothorax, or the surgical paralysis of the phrenic nerve. My own experience with this method, as well as the reports of others, convinced me that artificial pneumoperitoneum should be used in selected cases of pulmonary tuberculosis, particularly 1 when artificial pneumothorax is indicated, but cannot be established, 2 when the patient's age or general condition precludes bilateral artificial pneumothorax and thoracoplasty, 3 when the surgical paralysis of the phrenic nerve has not produced satisfactory improvement.

I have found that in unilateral pulmonary tuberculosis one can produce better results by the combination of phrenic nerve block and pneumoperitoneum than by either of these procedures alone.

It is not expected of the sanatorium physician to conduct animal experiments, although I realize that such work is being done in several tuberculosis institutions. But it is expected of him that he make use of correctly interpreted observations of others that were gained by laboratory or animal experiments. It is probably recalled that, shortly after insulin was discovered, rabbits that were used for essaying its strength gained in weight considerably. Marriotte from Washington University was the first who used it for the treatment of malnutrition in 1924. An extensive investigation followed concerning its applicability in tuberculosis. My asso-

* Presented at the Annual Meeting of the Southern Sanatorium Conference at Louisville, Kentucky September 19 1938

**From the Muirdale Sanatorium, Wauwatosa, Wisconsin, and from the Department of Medicine Marquette University School of Medicine Milwaukee, Wisconsin

ciates and myself have given insulin to non-diabetic tuberculous patients during the past five years Our experience taught us that it is safer to begin the treatment with five units three times a day, half an hour before meals, and increase it to three times ten or more daily, if necessary

Only moderately and far-advanced pulmonary cases were treated, in whom standard measures, and medicinal treatment, such as the administration of dilute hydrochloric acid and stomachics, failed to correct the lack of appetite, to increase the food intake and to induce gain in weight We had only one patient who developed an insulin shock while taking ten units of insulin three times daily This patient had fever and a high pulse rate Her food intake was not satisfactory The reaction reached its peak in three and a half hours following the injection during the afternoon "rest hours" It was promptly checked by intravenous dextrose and by giving several glassfuls of orange juice with sugar

Allergic skin reactions were seen in a few cases These manifested themselves either in generalized urticaria or in the appearance of a swelling the size of a walnut, with slight tenderness, itching, and redness at the site of each injection In some patients, these reactions were prevented by substituting beef insulin for pork insulin, in others the treatment had to be discontinued Symptoms of gastro-intestinal allergy due to insulin, first reported by Williams, were rarely seen in our group The analysis of the results in more than 100 patients treated by us has shown, as also had been reported by others, that improvement in the appetite, food intake, and gain in weight could be induced in the majority It is not proposed to use insulin as a curative agent But it is reasonable to assume that an improved nutritional condition attained by its use, may, indirectly, favorably influence the resistance, defense, and repair capacity of the body

The oldest approach to clinical research is the systematic application of empirical observations One of the best examples of this is the development of the balanced, vitamin rich diet Recent investigations revealed the fact that milk is of value not only because of its easy digestibility and high cal-

cium content, but also because it contains substantial amounts of vitamin A It is also known that fresh milk contains certain substances, known as inhibins, which have strong bactericidal properties Finding of large quantities of vitamin A in green vegetables, carrots and egg yolks aided the more intelligent dietary use of these foods It was discovered by Steenbock that the presence of vitamin A in plants and animal food products is characterized by yellow color This is covered up by the overwhelming amount of chlorophyll in green vegetables Vitamin A is not a part of chlorophyll, but closely associated with it A radical departure from the usual sanatorium diet was advocated by Sauerbruch, Hermannsdorfer and Gerson in 1926 Their diet is known as the S H G or salt free diet It excludes table salt, canned goods of all kinds, smoked and spiced meats, sausage and ham, smoked and salted fish Abundant amounts of fresh vegetables are encouraged, as is milk, especially raw milk, 1 to 1 5 quarts a day Patients on this diet are given liberal doses of calcium, viosterol or cod-liver oil The aim of the diet is to establish a shifting of the acid-base balance toward the acid side, the depletion of the water contents of body tissues and a shifting of the ion contents of the body by substitution of sodium by calcium Conclusions of different observers concerning the application of this diet are far from being unanimous It is generally conceded, however, that cases of lupus vulgaris respond to it the best We have been using a modified form of the S H G diet since 1929 in extrapulmonary tuberculosis as well as in pulmonary tuberculosis A salt substitute, "titro," is added to the food, thus rendering it palatable It is my impression that this diet is a valuable adjunct in the treatment of certain types of tuberculosis, particularly in lupus, renal, bone and joint tuberculosis

No matter how desirable it is to turn our attention toward the ultimate cure of tuberculosis, clinical research is obliged to attend to urgent questions we meet in our every-day practice None of these is more important than the management of cough There are two outstanding contributions to the understanding of the physiological aspects and the treatment of cough 1 the study of its mechanism by Coryllos, and 2 the epoch-making

discoveries of Henderson concerning the effect of carbon-dioxide upon the cardio-respiratory system Henderson and his associates recommended carbon dioxide inhalation for the prevention and treatment of post-operative massive atelectasis and pneumonia. It was shown that the respiratory center can be stimulated by these inhalations.

I have employed carbon dioxide-oxygen inhalations for the management of the cough of tuberculous patients since 1930. It is my experience that the inhalation of a mixture of 10 per cent carbon dioxide and 90 per cent oxygen is an efficient means for the liquefaction of bronchial secretions and for their removal from the bronchial tract. By its systematic use cough can be effectively reduced, and the use of narcotic medication lessened or entirely eliminated.

It is true that the huge volume of medical literature that reaches the press is discouraging, rather than encouraging, for the busy practitioner. This is well illustrated by the increasing number of medical "Literary Digests." Still, isolation from new communications would mean, at least, stagnation, if not a sure retrogression or deterioration in medical thinking. It is at the discretion of the sanatorium physician to choose his reading material with a critical mind—but read he must—and use his reading as a katalyzer for the betterment of himself and the condition of his patients. The examples of how findings and innovations in other branches of medical science are applicable in tuberculosis are many and their enumeration is beyond the limited space of this presentation. Not without hesitation, I would like to mention an instance of transferring observations of others into sanatorium practice.

In 1934 a series of publications appeared by Loehr who reported on the beneficial effect of the topical application of cod-liver oil in pyogenic osteomyelitis. I followed his work carefully because some years ago I had an opportunity to see the work of Campbell and Kiefer who showed that the addition of small amounts of cod-liver oil to culture media on which tubercle bacilli were grown, inhibited the growth of these micro-organisms. A brief presentation of my first clinical case is as follows:

A 27-year-old white woman was admitted to the sanatorium with the diagnosis of lupus vulgaris that involved the entire face, and the entire extent of the skin of the left arm. A partial destruction of the nose and upper lip was noted. The disease was of six years' duration when the patient was first seen. Prior to admission she was under the care of competent dermatologists. The process responded favorably to salt-free diet, but some of the ulcers on the face and arms remained open and produced considerable discharge. Cod-liver-oil dressings were applied to these areas from October 4, 1934 until May 31, 1935, at which time all ulcers were epithelialized. There is no doubt that the acceleration and completion of the healing was attributable to the effect of the topically applied cod-liver oil.

It is interesting to know that during the past two years Goetz at the University of Wisconsin was able to prove on a well-controlled, large experimental material that tuberculous ulcers of the skin heal rapidly by the topical application of cod-liver oil. Encouraged by my good fortune in the treatment of lupus vulgaris I attempted to treat other tuberculous manifestations by this method. For the treatment of ulcers of the pharynx and larynx a common atomizer is used and the oil is sprayed directly to the involved areas. Cod-liver oil is sterile in its natural state, it is not necessary to sterilize it before use. Pharyngeal and laryngeal ulcers showed rapid epithelialization and healing. Also a favorable therapeutic response was seen in cases in which there was a localized tuberculous infiltration or granulation. Laryngeal tuberculosis with marked edema is rather resistant to this treatment. I have been using cod-liver oil topically in ulcerating phlyctenular conjunctivitis, tuberculous ulcers of the tongue, and scrofuloderma. The results are very satisfactory. Cod-liver oil can be used by local injection for the treatment of ischiorectal fistula, sinuses following nephrectomy or epididymectomy for tuberculosis, suppurating tuberculous lymphadenitis, tuberculosis of the urinary bladder, and tuberculous empyema. My impressions are favorable enough to invite further study of this remedy in the treatment of these conditions.

Conclusions

The answer to the question — is it justified to do clinical research work in the sanatorium — cannot be anything but an affirmative one

There is a gold mine of opportunity in the tremendous patient material, and the imperative necessity for research is there also

The necessity for research is accentuated by essaying the accomplishment of the sanatorium during the past decade. The institution I am connected with can be taken as an example. Out of the total of discharged adult patients the classification on discharge was in 1928 25 per cent died, and 21 per cent unimproved, that is, failures in 46 per cent, in 1937 26.9 per cent died, and 21.5 per cent unimproved, that is, failures in 48.4 per cent

When interpreting these figures, one must keep in mind that the overwhelming majority of the patients reach the sanatorium in the moderately or far-advanced stage of the disease. This might explain, at least partly, why the treatment fails in so many instances

But, let us not forget that the chief cause of the failures is that the cure for tuberculosis, in the sense that it is available in diphtheria, malaria, or syphilis, is still missing. Finding it is a magnificent challenge, as well as a moral obligation, to all those who are engaged in the care and treatment of the tuberculous

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O B I T U A R Y

WILLIAM PERCIVAL ROSS, M. D

1893-1938

Dr William Percival Ross died suddenly of a heart condition in his home at Ottertail County Sanatorium, Battle Lake, Minnesota, on June 25th, 1938

Dr Ross was born in Woodstock, Ontario, Canada, in 1893. He moved with his parents to Saskatchewan when a small boy and obtained his preliminary education in that province. His medical education was obtained in the Manitoba Medical College, Winnipeg, where he graduated in 1923. His internship was obtained in one of the hospitals of Winnipeg. He was in general practice at Brandon, Manitoba, several years, following which he served as assistant physician at Ninette Sanatorium, Ninette, Canada

Dr Ross came to Minnesota in December 1929 and became a citizen of the United States in the summer of 1937. He held the position of assistant physician at the Southwestern Minnesota Sanatorium from the time he came to Minnesota until November 1st, 1937, when he resigned to take over the duties of Superintendent and Medical

Director of the Ottertail County Sanatorium, Battle Lake, Minnesota. This position he was holding with credit at the time of his death. He was always faithful to his duties and held high the ideals of his profession. The last ten years of his life was devoted to tuberculosis work, a phase of medicine in which he was intensively interested and to which he contributed much of value. He was unselfish in his interests, always thinking of others rather than himself. He had few interests other than his profession and his family, most of his spare time was spent in his home, for he was a devoted husband and father. He was a member of the American College of Chest Physicians, the Minnesota Sanatorium Association and the Minnesota State Medical Association.

He was married to Rita Brooks of Winnipeg on August 11th, 1926. She, together with two sons, William and James, survive him.

S. A. SLATER, M.D.
Governor for Minnesota.

The Diagnosis and Clinical Significance of Childhood Type Tuberculosis

SAM H SNIDER, MD, FACP
Kansas City Missouri

CHILDHOOD type tuberculosis in the chest includes all tuberculous infections in the chest prior to the development of the secondary pulmonary invasion, or adult type tuberculosis.

When the infection first takes place in the lung tissues, probably the most common route of infection, a Ghon tubercle is formed. This at first is not a true tubercle, but partakes more of the nature of an inflammatory reaction. This infection is usually followed in about ten days to three weeks by the development of allergy or sensitization to the protein products of the tubercle bacillus. At the same time, the infection spreads along the lymphatic channels from the Ghon tubercle toward the hilum lymph nodes. These become infected and enlarged and true tubercle formation takes place in them. Later the infection may spread peripherally from the hilum lymph nodes to the lymphatics in other parts of the chest and especially to the lymph nodes of the opposite lung, to the mediastinal lymph nodes and lymph nodes in other parts of the body. So long as the disease remains restricted to the lymph nodes and true secondary pulmonary invasion has not taken place, the disease is to be classified as childhood type tuberculosis.

The phenomenon known as allergic reaction plays a large and definite part in the pathology and symptomatology of the disease. It is altogether likely that fever, tachycardia, fatigue, and loss of appetite are due to this allergic reaction. This seems to be proved by the fact that the injection of dead tubercle bacilli, or their protein derivatives will produce exactly the same symptoms of toxemia.

Since allergy requires about ten to twenty days for its development, there is no very accurate means of differential diagnosis of the tuberculous lesion during the first few days of its existence. After two or three weeks, the tuberculin test usually becomes positive and may be used as positive evidence of tuber-

culous infection. The positive test gives us the very valuable information that tuberculous infection is, or has been present in the body. It does not differentiate the childhood type from the adult type of infection, nor is it an indicator of activity and progress of the disease.

Allergy lasts for a long time, but not necessarily for a lifetime, as is indicated by the fact that the incidence of positive tuberculin tests is far less than the incidence of autopsy-proven tuberculous infection. It is our custom to use the tuberculin test purely as a diagnostic measure and interpret it as meaning nothing more than that the individual has been infected with tuberculosis. False positives are practically unknown, so it is pretty safe to say that the individual with a positive Mantoux test has been infected.

Since the positive Mantoux gives no information about the extent and progress of the disease, it is necessary to use other means to determine this point. For this purpose, the Roentgen-ray plate and fluoroscopic examination are of great value. Roentgen ray plates seldom disclose the Ghon tubercle, for that is usually healed or resolved by the time the patient comes for observation. Frequently, however, the Ghon tubercle has undergone calcification and left a calcified node as evidence of its having existed. This may be termed the Ghon nodule. Thickening along the peribronchial tissues leading from the Ghon nodule toward the hilum is frequently seen and thickening and raggedness of the hilum are common. Retrograde peribronchial thickening in other directions is frequently seen and, if this shows definitely hazy margins, it is usually safe to say that pulmonary invasion is taking place. Then we have the adult type of the disease. This is the manner in which the insidious peribronchial spread occurs, the transition from childhood to adult type of the disease.

Occasionally, it is believed, a hilum lymph node ruptures into the bronchus and floods the bronchial tree with tubercle bacilli, in

which case acute tuberculous pneumonia may occur. This explains the influenzal or pneumonic type of tuberculosis and accounts for the sudden onset of adult type disease in a patient who was apparently in perfect health before. We also have the hematogenous spread, giving miliary lesions more or less throughout the body, resulting from the discharge of tubercle bacilli into the blood stream. Thus, we have three types of transition from childhood to adult type of disease—the insidious or peribronchial spread and the sudden pneumonic and miliary spreads. The latter types of extension cannot be accurately forecast, but the former, or insidious type of spread can be seen in its early stages and measures can be taken to prevent further ravages. It is this point that justifies our procedure in tuberculin testing children and in keeping them under continued observation. Every child who has a positive tuberculin test should have periodic x-ray examinations, for by so doing, the onset of adult clinical tuberculosis can frequently be foretold.

Exogenous reinfection is also a possibility that must be considered. While its part in the development of adult type tuberculosis is not altogether clear, it must be regarded as a danger, and every child should be protected against infection or reinfection as far as possible. Some authorities seem to be of the opinion that all, or nearly all, of the adult type tuberculosis is a sequel to exogenous reinfection. I am of the opinion, however, that most of the adult type tuberculosis arises

directly from the childhood type.

Physical findings in these cases are usually negative, with the exception of fever and tachycardia. A mild degree of fever does not demand that the child be put to bed for absolute bed rest, but that he should be put on restricted activities and given plenty of good nourishing food and natural, not synthetic, vitamins A, B, and D. Even with the use of such a program some patients are certain to breakdown with the adult type of the disease, but the breakdowns will be fewer in number and will be diagnosed early and present much less serious prognostic problems.

Since approximately 85 per cent of adults show scars of tuberculous lesions of the childhood type, and since the incidence of positive tuberculin tests in adult life is about 30 to 40 per cent, we may conclude that the major portion of the infected individuals have healed the tuberculosis and lost their allergy. Since about 7 per cent of all deaths are due to tuberculosis and 85 per cent of the community are infected, we may conclude that the ultimate death rate from childhood type tuberculosis is about one in twelve. We may expect a lowering of this rate with the measures that I have outlined for diagnosis and observation of infected cases.

Altogether, the picture presented by tuberculosis is much more hopeful than it was a few years ago, and increasing knowledge of its manifestations and increasing use of our measures against it may be expected to still further reduce the ravages of this disease.

221 Medical Plaza Building

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1939 PNEUMOTHORAX DIRECTORY

The American College of Chest Physicians announces that it will release within the next few days, the third revised edition of its Pneumothorax Directory. The 1939 directory will list 509 Fellows of the American College of Chest Physicians in forty-four states of the United States, the District of Columbia, Hawaii, the Philippine Islands, Puerto Rico, and Mexico. Unless otherwise designated in the directory, all of the Fellows whose names are listed are qualified and equipped to administer artificial pneumothorax

Special designations have been accorded to those Fellows of the College who are qualified as thoracic surgeons.

Because of the wide use of collapse treatment in respiratory diseases and the travel of patients who are in need of refills, the American College of Chest Physicians is supplying a need by publishing this handy reference book.

Every physician should own a copy or have access to a copy of the Pneumothorax Directory of the American College of Chest Physicians.

Bronchoscopy as an Aid to General Practitioner¹

H D HARLOWE, M.D.

Virginia Minnesota

IN the progress of medicine during the past twenty years, many new subjects have been added. In laryngoscopy, bronchoscopy has matured until in many hospitals it has become a separate department. At first used only for the recovery of foreign bodies aspirated or swallowed, it has now become a standard procedure in diagnosis and treatment.

I feel it might be worth while to the general practitioner to discuss briefly bronchoscopy and esophagoscopy, when indicated, when contra-indicated, its range of usefulness in diagnosis and treatment of disease.

Bronchoscopy is indicated for the following:

1 *Removal of foreign bodies* Here many cases inaccurately diagnosed as asthma, tuberculosis, and malignancy have proved to be aspirated foreign bodies which have become lodged in the lung. Many of these have remained here for months and even years. Objects such as peanuts, seeds, and those capable of producing arachidic acid are usually rapid trouble makers and should be removed as soon as possible. Contrary to usual belief, in Jackson's Clinic only 2 per cent of their work is the removal of foreign bodies.

The indications for bronchoscopy for a foreign body as outlined by Jackson are as follows:

- a The appearance in the roentgenogram of a foreign body or any suspicious shadow
- b Cases in which a clear history is given of the patient's having choked on a foreign body and the latter never found
- c Cases in which there are signs of stenosis of the trachea or the bronchus
- d Any case suspected of being bronchiectatic, to exclude the possibility of a foreign body
- e In the absence of any history of a foreign body, the patient giving symptoms of pulmonary tuberculosis without finding

of bacilli in the sputum, and especially if the physical signs are at the right base, above all, if there are signs of pleural effusion.

f In case of doubt

g If the presence of a foreign body has once been definitely established, there is only one treatment—bronchoscopy.

Foreign bodies of dental origin in the lungs are most important. They include foreign bodies of the following types: teeth, dental burrs, gold crowns, dental plates, fillings, parts of dental instruments, portions of plaster-of-paris casts, hard rubber from dental mouth gags, discs for dental cement and nerve canal reamers. The favorite site of lodgment of foreign bodies is in the right main stem bronchus, the ratio being approximately two to one. The majority of these accidents occur while the patient is under an anaesthetic. Swallowing of dental prostheses accidentally during eating is very common. Foreign bodies of dental origin produce symptoms similar to those arising from other inorganic objects. The train of symptoms to be expected are cough, pain in the chest, hemoptysis and dyspnea. These may be the only symptoms produced for years while, on the other hand, a lung abscess may develop within a very short time.

2 *Post-operative atelectasis* Here, following operation the bronchi become filled with a thick gelatinous secretion and at first contain no pus. Later this becomes purulent and a drowned lung results, finally resolving in a lung with purulent bronchitis, abscess or bronchiectasis. When this occurs, aspiration should be done immediately, it usually gives prompt relief, restores the lost aeration and recovery is uneventful.

3 *Bronchiectasis* Bronchoscopy is used here not as a curative measure, but for the relief it gives. It is not uncommon to have a patient come in and request bronchial suction because of the comfort it affords.

4 *Acute or chronic pulmonary abscess*

* Reprinted from *The Journal Lancet* Vol LVIII
No 7 July 1938

communicating with the bronchus Removal of the pus, crusts, and granulation tissue favors drainage. Combined with postural drainage and general health measures, bronchoscopy gives excellent results. Usually, however, this has to be repeated several times as one aspiration is not sufficient. Clerf advocates and obtains cures in 70 per cent of his cases of lung abscesses by bi-weekly aspirations plus complete bed rest and a high caloric diet. This is combined with postural drainage four times a day and the use of neo-arsphenamine if spirochetes are found in the aspirated pus. He obtains these results where treatment is instituted within three months of onset.

5 *Bronchial obstruction* This includes the non-opaque foreign body, a benign growth in the lumen, or enlarged lymph nodes or traction due to fibrous tissue.

6 *Case of unexplained cough persisting over a period of a month* Dixon reports a case of a patient whose cough persisted despite treatment for three months. On auscultation the lung revealed the presence of persistent rales. On bronchoscopy the bronchi were found to be red and velvety. Suction was used and the red areas were touched with silver nitrate. Following this, the patient became much more comfortable, the cough soon disappeared and the lung rapidly returned to normal.

7 *Unexplained dyspnea* Bronchoscopy is sometimes used here as an aid to diagnosis. However, it is not indicated in the dyspnea of angio-neurotic edema of the larynx, instrumentation aggravates this condition.

8 *Bronchoscopy is useful in the removal of diphtheritic membrane from the trachea and is often lifesaving*

9 *Lastly, bronchoscopic removal of tissue for biopsy gives much information and often helps in the prognosis and treatment*

Bronchoscopy is contra-indicated in serious organic disease such as aneurism, hypertension, advanced cardiac disease, acute alcoholism, acute respiratory infections and severe hemoptysis. Artificial pneumothorax and phrenicectomy are not exactly contra-indications. The diabetic should be under insulin treatment. The syphilitic should receive anti-luetic therapy before any work is done. Jackson, however, recognizes no absolute contra-

indications to bronchoscopy.

Esophagoscopy is indicated in

1 *The removal of foreign bodies* The contra-indications in such cases are usually practically nil. One point I wish to stress is that these cases are usually not emergency removals, but can wait until the stomach has been emptied. This makes for greater ease in working as the operator is not troubled with emesis. Food should be withheld for at least five hours before the esophagoscopy.

2 *Confirming the diagnosis of malignancy* Esophagoscopy gives us biopsy material. This is usually a safe, quick procedure and is attended with little discomfort. I was rather surprised, in going over the records in one of our larger hospitals, to find that most of the obstructions in the esophagus were diagnosed cancer by the x-ray alone, and not confirmed by biopsy. However, negative results do not mean freedom from cancer. In those cases where biopsy shows malignancy, radium may be implanted directly into the growth through the esophagoscope.

3 *Preventriculosis or cardiospasm*

4 *The swallowing of any caustic* Here it is best to begin the dilatation as soon as the wall of the esophagus will withstand instrumentation. This, of course, will depend on the severity of the burn, and will probably be from two to three weeks. If the patient is allowed to go until food no longer passes through, then the scar tissue has become so firmly organized that dilatation is long and difficult. This is often only possible by retrograde dilatation.

Esophagoscopy is contra-indicated in much the same types of cases as in bronchoscopy in the extremely ill, in cases of aneurism, hypertension, advanced organic disease, extensive esophageal varicosities, acute necrotic or corrosive esophagitis until sloughing has ceased and healing has strengthened the weak places. In the dehydrated patients, esophagoscopy should be deferred until water is supplied, in acidosis, until this is corrected.

As to the cause of our failures—well, the only fellow who has never failed is the one who has never tried. Bronchoscopy differs from all other nose and throat operations in that it is the only one where team work is essential. Kipling might have been speaking of bronchoscopy when he wrote

It ain't the individual
Or the army as a whole,
But it's the everlastin' team work
Of every bloomin' soul

In the general hospital, an ever-changing group of nurses and internes makes team work almost impossible. Most often the assistants have never been present at a similar operation and their part has to be explained to them pre-operatively. After the operation, their breaks in technique are explained to them so that it will not recur, but at the next bronchoscopy a new group is usually present. Most of these cases are charity cases and instruments are expensive. Usually one never gets the money he invests in these instruments returned, so that in most general hospitals, no instruments are provided. However, as the members of the staff and the general practitioners become more alert to this work and demand it, I feel sure this will be corrected.

We sometimes fail to recover foreign bodies because of the infrequent number of cases and the difficulty in working through a tube the size of a lead pencil, two feet long, the lumen of which is half filled with a grasping forceps.

Again we fail to recover biopsy material in suspected cancer cases, because on examination we find the lumen is compressed but smooth and there is no material to remove. Cracovaner in a report of 49 esophagoscopies at the Lennox Hill Hospital, New York City, found 41 cases yielded carcinoma on the first operation. However, 8, or 20 per cent, had to

be re-scoped on the average of four times and of these 8, five later yielded carcinomatous material after repeated esophagoscopies.

Conclusions

1 It can be said with certainty, "If a foreign body is aspirated into the bronchi and allowed to remain there, abscess formation will likely follow in the majority of cases."

2 In every operation about the mouth and when giving patients an anaesthetic, care should be exercised to prevent aspiration infection.

3 Symptoms in most cases following the aspiration of foreign bodies are immediate, namely, cough, pain in the chest and hemoptysis. Later symptoms may simulate tuberculosis. Many cases of foreign bodies in the lungs are often previously diagnosed as tuberculosis. Tuberculosis, may, however, co-exist with lung abscess.

4 Bronchoscopy is indicated in any case as a diagnostic measure if the history and x-rays are not conclusive.

5 When the presence of a foreign body has been definitely established, there is only one treatment—bronchoscopy.

6 Death is due in most cases to lung abscess, bronchiectasis, and gangrene.

7 Bronchoscopy offers a most helpful aid in diagnosis and treatment in the field of medicine.

8 This writer feels that the general practitioner may, in many cases, gain much by consulting with the endoscopist in regard to problems of diagnosis and treatment.

GOVERNOR OF COLLEGE FOR KANSAS REPORTS

Illustrations of the work accomplished in the past by the Tuberculosis Committee are as follows. Post-graduate programs are presented each year in various places throughout the state, the Committee has succeeded in joining together all agencies interested in tuberculosis in the state, and all now work in perfect harmony. The Committee has encouraged clinic and diagnosis facilities to be operated by the county medical societies and great progress is being made in this direction, arrangements have been made for free in-

struction in pneumothorax to be given at our state sanatorium and as a result Kansas is substantially expanding its pneumothorax facilities, a tuberculosis section is being maintained each month in our Journal, the arrangements have just been completed for 240 additional beds at the Norton sanatorium, the Board of Health is being assisted materially in expanding its tuberculin testing programs, and many other examples of efficiency can be cited.

F. L. Loveland, M.D., Topeka, Kansas

Organization News

Dr Frank Walton Burge, Philadelphia, Pennsylvania, Editor of Diseases of the Chest and Chairman of the Board of Regents of the American College of Chest Physicians, had a paper published in the Journal of the American Medical Association, (November 12, 1938) entitled, *The Treatment of Tuberculosis Under the Guidance of Organized Medicine The Pennsylvania Plan for Tuberculosis* The paper was delivered at the annual meeting of the American Medical Association in the General Scientific Session, at San Francisco, California, June 14, 1938 The American College of Chest Physicians is sponsoring "The Pennsylvania Plan for Tuberculosis" and results of the Committee for the Advancement of this Plan in Organized Medicine are published below

*Georgia Establishes
Tuberculosis Committee*

Dr Champ H Holmes, Atlanta, Georgia, President of the American College of Chest Physicians, was appointed Chairman of the Tuberculosis Committee of the Georgia Medical Society The other members of the Committee are Dr C D Welchel, Gainesville, H C Schenck, Atlanta, W C Cook, Columbus, H C Atkinson, Macon, R C McGahee, Augusta, R V Martin, Savannah, E F Wahl, Thomasville, J A Simpson, Athens, and W H Lewis, Rome In compliance with the "Pennsylvania Plan" of the American College of Chest Physicians, it is the plan of the above committee to establish Tuberculosis Committees in each of the County Medical Societies in the State of Georgia

Dr Ralph C Matson, Portland, Oregon, Chairman of the Committee for the Advancement of Tuberculosis Organization in Medicine of the American College of Chest Physicians, announces that the following states have reported the personnel of their State Medical Society Tuberculosis Committees

*Dr Charles S Kibler, Governor of Arizona
reporting*

ARIZONA

Dr E W Phillips, Phoenix, *Chairman*,
Dr S H Watson, Tucson,
Dr Z B Noon, Nogales,

ARIZONA (Continued)

Dr D W Melick, Williams,
Dr George Thorngate, Phoenix,
Dr Kent Thayer, Phoenix,
Dr R D Kennedy, Globe

*Dr Charles V Kaufman, Governor of Colorado
reporting*

COLORADO

Dr John B Crouch, Colorado Springs,
Chairman,
Dr Arnold Minnig, Denver,
Dr Leonard C Crosby, Denver

*Dr L D Phillips, Governor for Delaware
reporting*

DELAWARE

Dr M I Samuel, Wilmington, *Chairman*,
Dr Roger Murray, Wilmington,
Dr D T Johnson, Claymont,
Dr W M Johnson, Newark,
Dr L D Phillips, Marshallton,
Dr W C Deakyne, Smyrna,
Dr Stanley Worden, Dover,
Dr A C Smoot, Georgetown

*Dr M Jay Flipse, Governor for Florida
reporting*

FLORIDA

Dr Jay Flipse, Miami, *Chairman*,
Dr Wm C Blake, Tampa,
Dr J Maxey Dell, Jr, Gainesville,
Dr L Snyder Lafitte, Jacksonville,
Dr Duncan T McEwan, Orlando,
Dr John C McSween, Pensacola

*Dr F L Loveland, Governor for Kansas
reporting*

KANSAS

Dr H N Tihen, Wichita, *Chairman*,
Dr E K Musson, Topeka,
Dr J G Hughbanks, Independence,
Dr C H Lerrigo, Topeka,
Dr N C Nash, Wichita,
Dr C F Taylor, Norton,
Dr R L Gench, Fort Scott,
Dr F S Hawes, Russell

Dr Robert M Shepard, Governor for Oklahoma reporting

OKLAHOMA

Dr Carl Puckett, Oklahoma City, *Chairman*,
Dr W C Tisdale, Clinton,
Dr F P Baker, Talihina

Dr W S Rude, Governor for Tennessee reporting

TENNESSEE

Dr W S Rude, Ridgetop, *Chairman*,
Dr O N Bryan, Nashville,
Dr C M Oberschmidt, Memphis,
Dr J L Hamilton, Chattanooga

The Tuberculosis Committees of Pennsylvania and Texas have been listed in the previous issues of *Diseases of the Chest*. Other Tuberculosis Committees appointed by State and County Medical Societies will be announced in the future issues of *Diseases of the Chest*.

Dr Vest Honored

Dr Walter E Vest, Huntington, West Virginia, Governor of the American College of Chest Physicians for West Virginia, was elected as the President of the Southern Medical Association. Dr Vest is also a member of the Committee of seven physicians chosen by the House of Delegates to represent the American Medical Association in its discussions with the National Health Conference.

The following Physicians have been admitted as Fellows of the American College of Chest Physicians

Dr Octavio Bandala, Mexico City, Mexico,
Dr Henry L Dorfman, New York, N Y ,
Dr Herman A Gilda, Chambersburg, Pa ,
Dr E W Grove, Gainesville, Georgia,
Dr Charles L Ianne, San Jose, California,
Dr Victor M Leffingwell, Sharon, Penn ,
Dr Felix P Miller, El Paso, Texas,
Dr Francis P O'Hara, San Diego, California,
Dr Thomas F O'Leary, Mt Alto, Penn ,
Dr John Roberts Phillips, Houston, Texas,
Dr Chas W Rieber, Forest Hill, New York,
Dr Rufus A Schneiders, San Diego, Calif ,
Dr John C Sharpe, Salinas, California,
Dr Samuel J Sills, Los Angeles, California,
Dr Orville F Swindell, Boise, Idaho,
Dr Lawrence O Toomey, Bowling Green, Ky ,
Dr Frank R Wheelock, Scranton, Penn ,
Dr Harry P Thomas, San Antonio, Texas

Past, Present, and Future

The Southwestern Medical Association has honored the American College of Chest Physicians by the election of three of its Fellows in succession to the position of President of the Society. Dr LeRoy S Peters of Albuquerque, New Mexico, Governor of the College for the State of New Mexico is the retiring president, Dr Howell S Randolph, Phoenix, Arizona, a Fellow of the College is the incoming President, and Dr Orville E Egbert, El Paso, Texas, Governor of the College for the State of Texas, is the President Elect.

SOCIETY NEWS

Dr Jay Arthur Myers, Minneapolis, Minnesota, Regent of the American College of Chest Physicians, will address the Health Forum sponsored by the Jackson County Health Forum at Kansas City, Missouri, on December 21st. The title of Dr Myer's address will be *Tuberculosis*.

Dr Anthony V Cadden, Hopemont, West Virginia, a Fellow of the American College of Chest Physicians, addressed the meeting of the West Virginia Tuberculosis and Health Association. The title of his paper was, *Results of Modern Methods of Sanatorium Treatment*.

The so-called "Humane Pound" Law, which opposed the vivi-section of animals for experimental and scientific purposes was defeated in California by a two to one vote. The American College of Chest Physicians through its Committee on Resolutions was one of the many medical societies to go on record as being opposed to the passage of the law.

Dr Robert M Shepard, Tulsa, Oklahoma, Governor of the American College of Chest Physicians for the State of Oklahoma, delivered a paper before the meeting of the Tulsa County Medical Society. The title of his paper was, *Early Tuberculosis and its Diagnosis*.

Dr Sidney A Slater, Worthington, Minnesota, Governor of the American College of Chest Physicians, presided at the thirty-second annual meeting of the Minnesota Public Health Association. Dr Slater is the President of the Association.

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F. M. POTTERER, JR., M.D.	Assistant Physician

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DECEMBER

DISEASES OF THE CHEST

1938

Dr Joseph Rosenblatt, Duarte, California, a Fellow of the American College of Chest Physicians, addressed the opening meeting of the year of the Trudeau Society of Los Angeles on October 25th at Los Angeles, California

Dr M A Cunningham, a Fellow of the American College of Chest Physicians announces his removal from Deming, New Mexico to El Paso, Texas, where he will be engaged in private practice, Dr Cunningham was formerly the medical director of the Holy Cross Sanatorium at Deming, New Mexico

Dr Robinson Bosworth, East St Louis, Illinois, President of the Illinois Tuberculosis Association and a Regent of the American College of Chest Physicians, was on the program of the Illinois Public Health Conference held at Springfield, Illinois on November 30th Dr Robinson spoke on *The Tuberculosis Situation in Illinois*

Dr Frank Walton Burge, Philadelphia, Pennsylvania, was the guest speaker on the program of the South Branch of the Philadelphia County Medical Society, held at Philadelphia on October 27th Dr Burge spoke on *Organized Medicine*

Dr Carl Howson, Los Angeles, California, a Fellow of the American College of Chest Physicians, has been appointed as the Medi-

cal Director of the La Vina Sanatorium at La Vina, California Dr Howson will continue with his private practice at Los Angeles, as usual

Dr J M Appel, Cleveland, Ohio, a Fellow of the American College of Chest Physicians, has resigned the position as Medical Director of the Mount Royal Sanatorium, at North Royalton, Ohio, to go into private practice His place will be filled by Dr Stanley Greene, formerly of Sunny Acres Sanatorium, Warrensville, Ohio

Dr H C Stewart, Memphis, Tennessee, formerly with the State Board of Health of Tennessee, has been appointed Co-ordinator of tuberculosis for Cleveland and Cuyahoga County Dr Stewart's duties will be, with the advice of the respective commissioners of health in the county, to formulate educational policies relative to tuberculosis, to cooperate with the commissioners of the county to secure more uniform methods of finding and following up cases of tuberculosis, and to act as liaison officer between health officers and the Board of County Commissioners

ERRATUM

On the cover page of the November issue of Diseases of the Chest, Dr Redford A Wilson's name was inadvertently omitted as the co-author of the paper entitled, *An Observation on Pulmonary Tuberculosis when Complicated by Laryngeal Tuberculosis*

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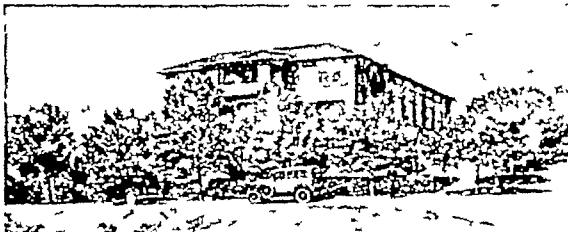
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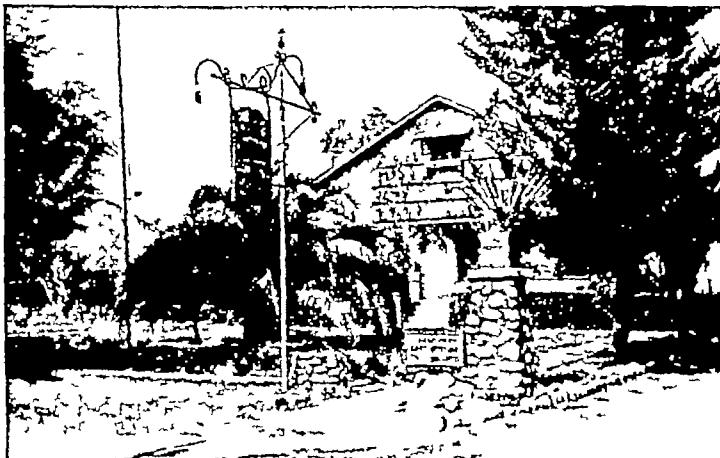
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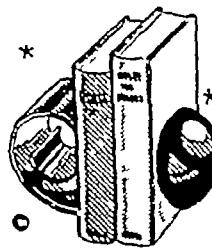


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Book Review

DISEASES OF THE CHEST AND THE PRINCIPLES OF PHYSICAL DIAGNOSIS By George W Norris A B, M.D. Formerly Professor of Clinical Medicine in the University of Pennsylvania, Chief of Medical Service "A", Pennsylvania Hospital, Erstwhile Colonel, M C U S Army, and H R M Landis A. M., M. D., Sc. D., Formerly Professor of Clinical Medicine in the University of Pennsylvania Sixth Edition, Revised 1019 pages with 478 illustrations Philadelphia and London W B Saunders Company, 1938 Cloth \$10.00 net

"Norris and Landis" has long been an established text-book on this subject. The text requires no introduction at this time, as would an absolutely new treatise on the subject of diseases of the chest. This reviewer, however, is struck by its compactness, clarity, and scope. Each time reference is made to the text

Much lamentation is made by many of the older clinicians relative to the apparent trend of medicine toward over-reliance on laboratory methods for diagnosis. With such reliance the art and science of physical examination and diagnosis has been too frequently lost to recent graduates. With this in mind the authors first published this book in an effort to set forth concisely and graphically the basic principles of *physical* examination of the chest.

In this, the 6th edition, the authors have deleted many unnecessary chapters found in the previous editions and have completely rewritten the chapters on electrocardiography, lung abscess, bronchiectasis, coronary disease, etc. The new chapter dealing with x-ray in diagnosis of the heart and great vessels is excellent. The chapter on electrocardiography and the cardiac arrhythmias is concise but

very complete, and, as is usual in the book, is illustrated. Electrocardiograms are present in the illustrations, covering practically every possible variation shown in cardiac pathology.

One of the outstanding features of this volume is the excellent illustrative material. The graphic illustrations of physical signs in the chest are splendid and of great value in the teaching of physical examination to students.

The anatomical sections found throughout the book are of inestimable value to students and also to the practitioner who has not ready access to an anatomical or pathological museum. These illustrated anatomical sections alone are worth the price of the book.

The text deals exclusively with the diagnosis of diseases of the chest, including diseases of the lungs and pleura and diseases of the heart and all of its manifestations. Each disease is taken up in a logical order and disposed of in the shortest possible space so that the reader can easily find the facts regarding any certain problem without waste of time.

This is a volume that should be in the hands of every medical student, and in the library of not only the specialist in diseases of the chest and heart but of the general practitioner, whether he is in the city or in rural practice. Frequent reference to Norris & Landis on diagnostic problems will keep the physician alert and well-equipped in physical diagnosis.

R B H Jr

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31—REQUIREMENTS FOR THE CARE OF THE TUBERCULOUS PATIENT

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Volume IV.

November 1938

Number 11

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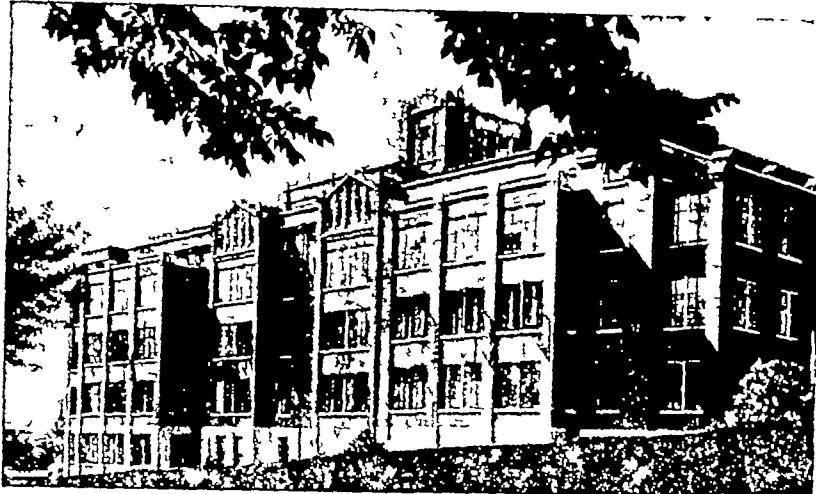
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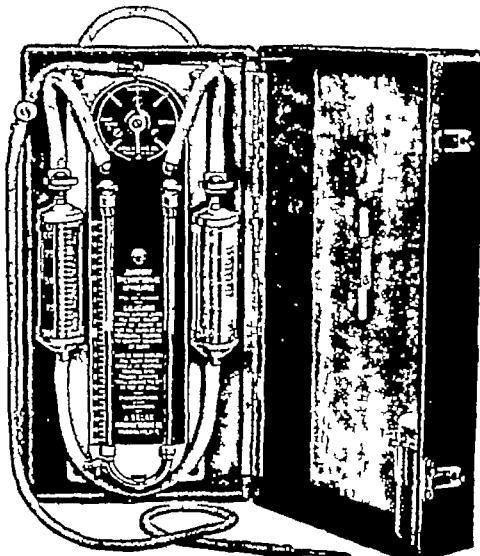
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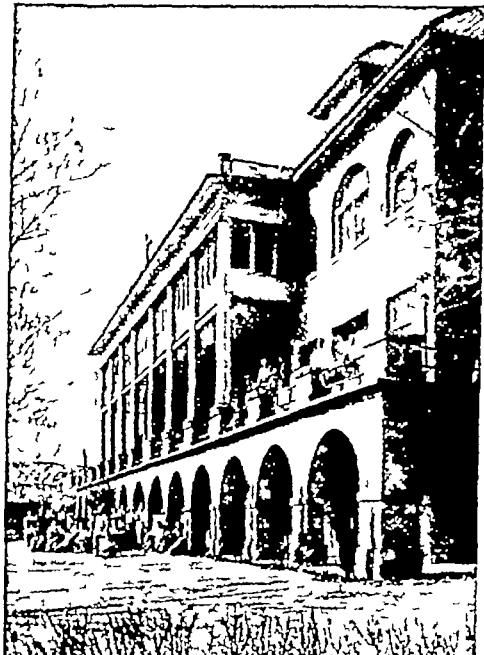
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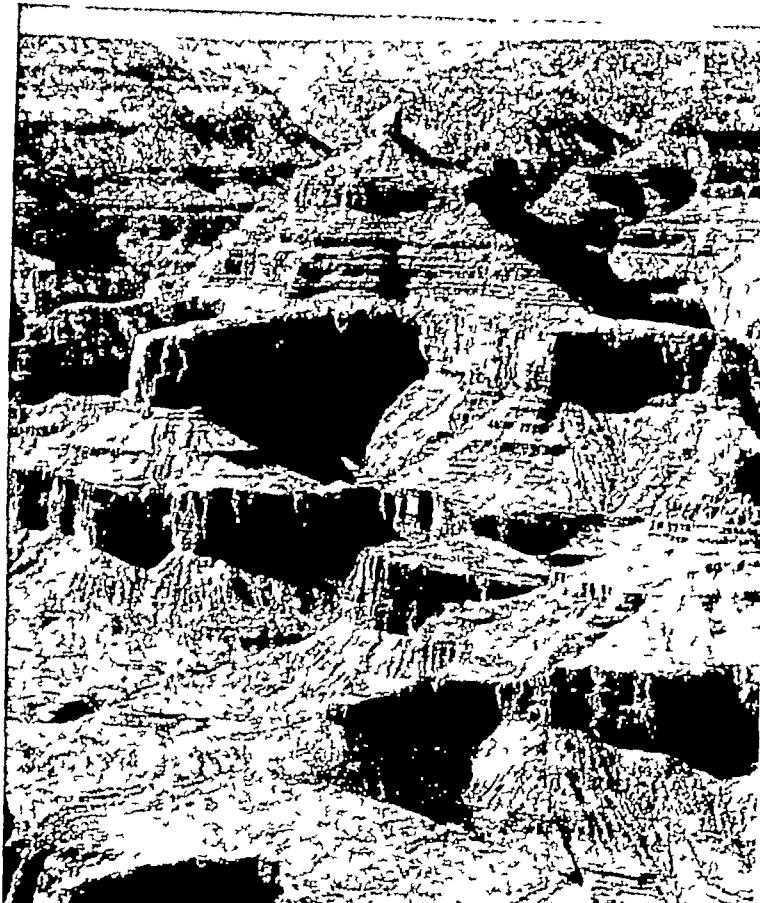
DECEMBER

1938

Sanatorium Digest

Volume I.

Number 12



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Official Organ of the Amer College of Chest Physicians
Editorial offices 1018 Mills Building, El Paso, Texas
Business Address P O Box 1069, El Paso, Texas
MEMBER ASSOCIATED EDITORS OF TUBERCULOSIS PUBLICATIONS

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(A MONTHLY PUBLICATION)

Subscription United States and
Canada \$2.00 per year Other
countries \$2.50 per year
Entered as second-class matter
August 18, 1936, at the post office
at El Paso Texas under the Act
of August 24, 1912

Editorial Comment



THE ANNUAL
RED CROSS
ROLL CALL

THE annual roll call of the American Red Cross begins on November 11th, the anniversary of the end of the world's most disastrous war.

The first recorded instance of impersonal instinct of compassion and mercy in war is dated 1000 A D when Haldora the Dane, together with the women of her household sallied forth to dress the wounds of the warriors, friend and foe alike. The next recorded instance was in 1654 when the Knights Hospitallers organized volunteer war relief societies.

In the 19th century, Florence Nightingale, during the Crimean war, brought forward almost a perfect blossom of this altruistic ideal.

Later, Henry Dunant, the founder of the

Red Cross, gave his life and fortune to the same ideal. During our own Civil War, Clara Barton, who later became the first president of the American Red Cross, brought these ideals to our own battlefields.

Every physician should read Gumpert's "Life of Henry Dunant" and the Story of The Red Cross. Gumpert himself is a physician, and a German exile. Gumpert reviews the personalities and historical events which had so much to do with the awakening of humanitarianism in the 19th Century, and sharply contrasts that with the barbarism of the undeclared wars of today.

During the annual roll call this year, it behooves every American to take into consideration the dark outlook for peace. Peace cannot continue unless there is an about-face on the part of the totalitarian governments. With the whole world re-arming at a rapid pace, forcing our own country into this race, it should be clear that during all these preparations the Red Cross should be fully prepared to meet the catastrophe of war as it has always been able to meet the catastrophe of any other disaster.

The physicians of America hold an enviable position in relation to the Red Cross and, whenever possible, should take an active part in the assistance of their local chapters in making this annual roll call a success. C.M.H.

NOW WE HAVE REAL COOPERATION THE following article was published recently in the Daily Newspaper of a small town

"Doctors to Give Tests on Monday"

"Tuberculin tests will be given boys and girls of high school age beginning at 10 o'clock Monday morning at the senior high school, according to announcement last night

"The tests will be made at no expense to the parent by Dr Elmer Highberger, Jr, M.D., medical director of Grand View Institution and by Dr James A Welty, school physicians, who have been authorized by the Venango County Medical Society to make the tests

"They will be assisted by Mrs Laura Schubert, school nurse and Miss Jean Taggart, executive secretary of the Venango County Tuberculosis Association

"Giving of the tests will represent an instance of the cooperation of the family doctor, the Venango County Tuberculosis Association and the Venango County Medical Society

"All reports will be sent to the family doctor, designated by the student. The family doctor will assume the responsibility of informing the parents of the results

"The plan of testing is done in pursuance of the so-called Pennsylvania Plan for the control of tuberculosis, which has been initiated by the Committee on Tuberculosis of the Pennsylvania Medical Society and endorsed by the Pennsylvania Tuberculosis Association and the Secretary of Health

Chief aim of the Pennsylvania Plan is to secure cooperation among the four agencies responsible for reduction in mortality from tuberculosis in the state, the family physician, the State Tuberculosis Association, the State Medical Society, and the State Department of Health"

This is an excellent example of What Organized Medicine can do for Public Health, and incidentally, it is what Organized Medicine must do if it is to remain Organized Medicine, and not be changed into State Medicine

We must face facts Unorganized doctors will never perform Tuberculosis Case Finding

Surveys and, without such surveys, Tuberculosis can never be eradicated

Cooperation of organizations, lay and medical, is rapidly spreading throughout the United States Where it is lacking, we have disgusting bickering instead of life saving early case finding

F.W.B

THE HEART IN AS we consider the patient **TUBERCULOSIS** with the diagnosis of his condition in mind and,

later, the method or methods to be used in curing the tuberculous infection, we are, perhaps, too prone to consider only those parts in his body most likely to be directly affected by the disease We find his lungs infected and immediately use every means possible to ascertain whether or not he has tuberculous enteritis, laryngitis, infected kidneys or bladder, epididymitis, in fact, anything which might complicate an uneventful recovery from his tuberculosis

We find that he has a rapid pulse and becomes short of breath after even a small amount of exercise and we say that this is caused by his toxemia but, in far too many cases, we do not stop and consider the more immediate cause, myocarditis'

We find the case of pleurisy with effusion, dyspneic and cyanotic, as is the one with spontaneous pneumothorax or induced pneumothorax with a too flexible mediastinum, and we blame it on the fact that too much breathing space is thrown out of commission in too short a time *This is not so!* We do, however, find that the heart and great vessels have been thrown out of their natural bed

Later in the disease we encounter the case of fibroid phthisis in which the heart is displaced more gradually but none the less completely with the same result In this type of case we also find the pulmonary circulation interfered with by cicatrization with a resulting right-sided hypertrophy and a later embarrassment

Myocardial degeneration is found in all cases of long standing tuberculous infection, due most likely to the nutritional disturbances accompanying the disease, but a more acute myocarditis frequently present and overlooked is undoubtedly due to the constant presence of large doses of tuberculin coursing through the heart muscle It must not be

overlooked that, since the heart muscle is the most active muscle in the human system, and, therefore, requires and gets a more generous blood supply than other muscle, that it is as a result going to suffer more quickly and more extensively from toxemia

Sudden death following spontaneous pneumothorax is not due to suffocation or air hunger in most cases, but is due to the shock and insult to the heart and great vessels in a marked and rapid shift of the mediastinum

Right-sided hypertrophy is gradual and due to a constantly increasing impediment to the blood flow through the lungs in fibroid tuberculosis. Right-sided failure is usually terminal in these cases, and is characterized by edema, ascites, and liver congestion

Scar tissue formation with its attendant distortion and narrowing of the lung field on the affected side, pull the heart out of position, causing it to rotate on its axis with danger of partial closure of the coronaries near their openings in the aorta. This is more apt to occur in fibrosis of the left apex. The same result is encountered in the cirrhotic lung, so often encountered when a collapse therapy is discontinued, with a resulting partial atelectasis. We also find this happening occasionally in induced pneumothorax or in hydrothorax, due to displacement as a result of pressure

In every case of tuberculosis where there is any evidence of cardiac involvement, a complete heart examination should be done. Frequently, early progressive damage to the myocardium can be halted—progressive distortion with resulting mediastinal displacement can be remedied by surgical procedure—more care can be observed in inducing pneumothorax—a more definite prognosis can be given in surgical procedures—exercise can be graded more carefully

A very instructive and enlightening paper by Leverton in *Annals of Internal Medicine*, September, 1938, concludes with the statement, "The electrocardiogram is of value in the diagnosis of cardiac lesions associated with pulmonary tuberculosis. It is frequently the only positive evidence of myocardial disturbance."

**PHRENIC
NERVE
OPERATION**

WHILE OPERATIONS on the phrenic nerve require skill and a knowledge of the local anatomical structures, the operation itself is relatively a simple one. It is done under local anesthesia, and there is little or no accompanying shock. The post-operative disability is of brief duration, usually requiring only 24 hours hospitalization. It has been performed in the doctor's office and even in the patient's bed room. For these reasons it is tempting to many to glibly advocate and perform surgery on the phrenic nerve without any profound consideration of the case. Such operations encompass cutting, crushing and extracting portions of the phrenic nerve, as it courses through the base of the neck.

Phrenic nerve surgery does not occupy today the exalted position of a few years ago, at which time it was on the ascendancy. The pendulum is now swinging somewhat the other way. In the cold light of experience, and with further advances in collapse therapy, the procedure is being viewed more rationally, wisely and sanely, and with, subsequently, less fervor and enthusiasm. The trend seems to be definitely away from employing phrenic nerve interruption as a primary therapeutic mode, but rather as a supplement to other forms of lung collapse. The method, in itself, is not a curative one in by far the majority of instances. While in some cases brilliant results have been achieved, and will continue to be achieved by operations on the phrenic nerve as the sole or primary procedure, in the main, only disappointment will accrue.

Today, the consensus of opinion is that crushing the phrenic nerve, producing a temporary paralysis of the hemi-diaphragm, lasting six to twelve months, is the operation of choice. The nerve may be re-crushed as often as conditions indicate. The permanent diaphragmatic paralysis following the exeresis of a segment of the nerve, must be undertaken only after a most meticulous study of the case, and after prolonged and serious deliberation. It must not be forgotten that the diaphragm is probably the second most important muscle in the human body, and to permanently paralyze it must be ventured only after the utmost consideration.

R.H.H

C H H

Treatment Of Empyema

VICTOR STRONG RANDOLPH, M.D., F.A.C.S.
Phoenix, Arizona

THE purpose of writing about the treatment of acute empyema is not to introduce anything new, but rather to emphasize the adequate early treatment so that it may not be prolonged for months or years into a state of chronic empyema.

Tuberculous empyema I will not discuss as it is a subject by itself, but rather the ordinary type of empyema caused by streptococcus, pneumococcus or, rarely, staphylococcus. This occurs most commonly following pneumonia, less often following abscess of the lung or trauma of the chest wall.

In the ordinary case of pneumonia, after the crisis has been reached and the patient seems about to recover, he becomes sick again and has the appearance of sepsis with a recurrence of fever. Physical examination will then disclose signs of fluid in the chest and its presence can be easily verified by simple aspiration.

In the early treatment of acute empyema, aspiration is the most important measure. The fluid found following pneumonia may be clear and sterile and, in some cases, disappears after aspiration and causes no more trouble. However, even when it is clear at the first aspiration it may, in later samples, contain pus and, as aspirations continue, become definitely purulent. The thin pus which at first occurs must be aspirated several times, usually every two or three days or oftener, until it becomes thick.

The purpose of repeated aspirations is to allow the formation of fibrin and a definite inflammatory reaction along the mediastinum which causes the mediastinum to become fixed. If the mediastinum is not fixed, opening of the chest in operation may cause a shifting of the mediastinum to the opposite side of the chest and embarrass the heart and respiration. This is particularly true if an open type of operation is used, where air enters freely and where, if the mediastinum is mobile it causes a definite air pressure on the operated side.

After the pus has become thick and filled with fibrin, an inflammatory reaction along

the mediastinum occurs which is sufficient to prevent the mediastinum from shifting when air is admitted to the chest.

The patient is then ready for operation, which is usually the removal of a small piece of rib. It is my experience that the chest should be opened at the lowest possible point in the pleural cavity. In the second place, a tube must be used for drainage which is large enough to prevent its becoming plugged by fibrin. This may, at times, happen even with a very large tube, but with a small tube a great deal of difficulty may be encountered due to plugging. In only one case have I found that the large tube which I used became plugged and had to be removed at least twice and cleaned. Nevertheless, we do see cases at times that may be drained with a small tube such as a catheter. This type of tube may be inserted between the ribs without resection. One such case of mine was a physician's wife who did not wish to have her rib cut and drainage was done by a catheter by means of keeping the tube very well cleaned out with frequent irrigations. Some years ago Alexander recommended two tubes for treatment of empyema, one for drainage, the other an interspace higher for instillation of irrigating solution.

A point which I should like to insist upon is that closed drainage should be instituted. By closed drainage, I believe we can assist the lung underlying the empyema to expand. The empyema cannot be entirely healed unless the lung re-expands entirely and becomes adherent to the chest wall. After this has occurred, there is no potential space in which another empyema can be formed. My principal reason for insisting on closed drainage is that I have seen quite a large number of cases of chronic empyema in which the lung had not re-expanded after open drainage and the patient therefore had been sick for a period of months to a period of years. In no case thus far have I seen the lung fail to expand fully and the empyema to remain healed after closed drainage, although in one case I was obliged to re-insert the tube once

because a small pocket remained where the lung had not become adherent

Weinberg reported, in April at the Thoracic Surgery Association meeting, 40 or 50 cured cases of empyema drained by an intercostal incision, removal of the intercostal tissues and irrigation. In one or two of my cases of open drainage, I have noted the re-expansion of the lung, but my experience with chronic empyemas leads me still to insist on the use of closed drainage in the average case

Although a number of tubes suitable for closed drainage are made I have used for about ten years the tube of Tudor Edwards of London which is so made that an inner flange resting upon the parietal pleura prevents the tube from slipping out and an outer flange can be attached to the skin of the chest wall. Within the cuff and next to the drainage tube is a small tube insert through which one may irrigate the chest if desired. In my use the drainage tube is attached to a long rubber hose which passes into a jar of sterile water on the floor by the bedside, the end of the tube resting beneath the level of the water so that air can pass from the chest and bubble out through the water, but no air can enter the tube from the outside because the end is beneath the level of the water. A small quantity of water is sucked up in the tube by the negative pressure of the chest and this in turn exerts a slight pressure on the air in the pleura and therefore tends to aid the lung to expand.

With this method of closed drainage I favor irrigation of the chest at first three or four times daily with salt solution. After the first day or two Dakin's solution may also be used, at first in small quantities and later freely. It may be that Dakin's solution does tend to cut down the formation of fibrin and thus prevent the tube from becoming blocked. At any rate, the irrigation does keep the tube free of fibrin. If irrigation is carried on through a single drainage tube, care must be taken not to over-distend the empyema pocket when injecting the solution. If a separate tube is used for irrigating, the over distention cannot occur. Irrigation is, of course, not absolutely essential to the treatment of empyema, but it does serve to remove pus more completely from the pleural surface and keep the fibrin well washed away so that

it may not plug the tube

When drainage is well established the temperature should come to normal in a day or two and remain down as long as drainage is well established.

A simple complication of acute empyema is the presence of a small pneumothorax even when no abscess of the lung is present. Usually, this pneumothorax disappears when the opening in the lung which caused it closes, and this may occur with simple closed drainage. However, if the opening or bronchial fistula persists, thoracoplasty may eventually be necessary to close the empyema cavity. If there is an underlying abscess in the lung, drainage of the abscess or lobectomy may have to be done.

If the lung has not been fully re-expanded and if the visceral and parietal layers of the pleura have not come into complete apposition during the drainage of acute empyema, a condition of chronic empyema occurs. This may last for months or even for years. Occasionally such a chronic empyema may cure itself spontaneously by burrowing through the chest wall and draining to the outside, but this is rare.

At times chronic empyema may be cured by closed drainage. This, however, depends on the lung expanding so as to fill the chest. Usually the lung is bound down by thickened pleura and will not expand sufficiently. In these cases, if the empyema is not large, it may be cured by removing the chest wall, including the ribs, intercostal bundles and periosteum and parietal pleura over the empyema pockets, and allowing the defect to fill in by granulation tissue. If the empyema pocket is large, an unroofing of this type must be done and later the defect may have to be closed by some type of thoracoplasty.

One of the first cases of chronic empyema which I saw was that of a woman 25 years old who had had pneumonia followed by empyema 19 years before at the age of six. She was treated by tube drainage, but not completely healed, for in the intervening 19 years she had had six additional operations for the empyema which kept recurring. However, her chest wall was healed. She had been aspirated repeatedly during the two or three months prior to my seeing her. I did not in this case attempt closed drainage, but re-

moved the two or three ribs immediately over the pus pocket together with the parietal pleura, periosteum and intercostal bundles, leaving the pocket entirely exposed. The skin was sown to the edges of the parietal pleura where it had been cut. In a few weeks this pocket filled in by granulation tissue and eventually was covered by skin. The patient recovered entirely. However, she had suffered a great deal of illness during the 19 years and was left with a chest wall defect because of the fact that the empyema had not been completely drained and the lung expanded originally.

A man 50 years of age gave a history of empyema at the age of 18, which was treated by rib resection and either open or tube drainage. His chest wall healed after a period of time, but he was never in good health afterwards. About a year prior to the time I saw him, he began to have periods of fever followed by cough and expectoration of a large amount of purulent and greenish sputum. This would stop and after a few weeks or less he would again have fever with pain from which he would recover after a few days of cough and expectoration. At the time I saw him he had developed a superficial abscess in the left lower anterior chest wall. This was opened and bromopin injected. There was an extensive deformity of the chest, which I presume was caused by the long standing pleural infection. The chronic empyema cavity was protracted by the bromopin. This man also was treated by resection of the ribs overlying his empyema cavity and

by the removal of sheaths of calcified parietal pleura in addition to the periosteum and intercostal bundles.

A boy 21 years old with a history of empyema at the age of five gave a similar history. This boy was cured by unroofing of the empyema cavity and the granulating in of his pleural pocket. In this case I attempted to cure the condition by instituting closed drainage, but a small bronchial fistula was present which prevented the lung from expanding. The fistula healed after the empyema pocket was unroofed.

I could cite many similar cases of chronic empyema. The period following the original empyema varies from a few months to, in one case, thirty-two years. These chronic empyemas point ever so strongly to the need for early adequate drainage of acute empyemas of the pleura and re-expansion of the undiseased lung.

Summary

- 1 The treatment of non-tuberculous empyema is discussed.
- 2 The drainage site must be at the lowest point in the pleural cavity.
- 3 A large enough tube must be used to insure continuous drainage.
- 4 Closed drainage is to be preferred.
- 5 Irrigation is of some value.
- 6 Chronic empyema occurs when the lung has not been fully re-expanded during drainage of the acute empyema.
- 7 Chronic empyema may be cured by "unroofing" with or without some form of thoracoplasty.
- 8 Chronic empyema should be avoided by proper drainage of acute empyemas and re-expansion of the underlying lung.

Contract Let for Tuberculosis Hospital

At a meeting held on October 5th, the Board of Directors of the Arkansas State Tuberculosis Sanatorium let a contract for the construction of a main hospital building to be located at the State Sanatorium. The building, when completed, will have a bed capacity of 521 and will cost \$700,000. Dr J D Riley, Governor of the American College of Chest Physicians for the State of Arkansas, is the medical director and superintendent of the sanatorium.

Koch Hospital to Obtain State Aid

The Robert Koch Hospital at St Louis has submitted plans for a \$2,000,000 building program which will increase the capacity of the sanatorium from 550 to 1,000 beds. The plans also include new buildings for administration, nurses, and employees. The state laws allow for counties building sanatoria, \$12.50 per week for the support of each patient. St Louis, which has the status of a county, has, up to the present time, paid the entire cost of maintaining the Koch Hospital.

Some Problems in the Early Diagnosis and Early Treatment of Pulmonary Tuberculosis

ELMER HIGHBERGER, M.D. *

Oil City Pennsylvania

HERE are two maxims to be applied in the early diagnosis and the early treatment of pulmonary tuberculosis. The first is that of the late Lawrason Brown "The most important factor in diagnosis in the majority of cases of pulmonary tuberculosis is keeping the disease in mind." The second comes from Lord Lister "For a physician there is only one rule. Put yourself in the patient's place."

One major cause of failure to achieve early diagnosis and subsequent early treatment is the neglect of the patient to consult a physician as soon as he or she becomes ill. The other major cause is the delay in establishing the diagnosis once tuberculosis is suspected. Educational programs sponsored by local, state and national medical organizations with physicians of recognized authority acting as spokesmen by means of the radio broadcast, the public address and the newspaper column, to inform the public of the methods of preventative medicine as applied to tuberculosis will help prevent this dangerous apathy. Physicians are becoming increasingly aware of the dangers attendant on procrastination in diagnosis.

An appraisal of the relative merits of the various diagnostic methods to be employed is of practical value. It is important to observe that the most painstaking physical examination is far inferior as a diagnostic aid to an adequate clinical history, considering the patient's past, family and personal histories in detail. Suspected cases in children and young adults should be tuberculin-tested by the Mantoux method with final concentrations of old tuberculin giving a dosage of 1 milligram, or with P.P.D. giving a dose of .005 milligrams. The results of the tuberculin test are to be considered simply as a positive or negative index of the presence of either a quiescent or active tuberculous infection. All positive reactors should be x-rayed. The roentgenograph and, particu-

larly, the stereoröntgenograph are to be preferred to fluoroscopy. Whenever it is possible, the readings should be made by a roentgenologist trained in tuberculosis or by a roentgenologist in collaboration with a physician or phthisiologist.

In those cases coming to the attention of the physician in the moderately advanced or advanced stages of the disease, which is the general experience, the most economical and most conclusive diagnostic test is an examination of a three-day specimen of the sputum for the tubercle bacillus. This is easily done in the physician's office. A single negative examination of the sputum is inconclusive. Repeated examinations of three-day specimens are to be recommended. Concentration of 5-30 cubic centimeters of the sputum of a three-day specimen by one of the common methods, i.e., the antiformin method, will increase the number of positive results by 25%. Guinea pigging the sputum will be necessary in occasional cases. Certain suspected cases of tuberculosis will require a period of observation that will include taking the temperature four times a day with the so-called minute thermometer in the mouth for at least five, preferably seven minutes. The diagnosis of tuberculosis is not entirely a laboratory problem.

Since every discovered case of tuberculosis is to be considered a contact case, the diagnostic problem is incomplete without a careful inquiry into the health of the patient's relatives and friends. Although the family vigorously objects to the idea that a focus of infection may exist within the family circle, they can be convinced by patient insistence on the part of the physician to readily cooperate in the tuberculin-testing of all contacts and subsequent x-raying of all positive reactors.

This is necessary, because the family is equally, or probably more willing to adopt the attitude of the physician, who, because of fear of alarming the group of friends and

* Medical Director Grand View Institution

relatives, permits them to enjoy a false sense of security saying that since the open or diagnosed case of tuberculosis is removed from the household to a sanatorium or is placed under a regimen that prevents or mitigates the spread of the infection to those in the patient's environment, there is no danger. This attitude fosters a disregard of fatigue, loss of weight in adults or failure to gain weight in the case of children, fickle appetite, prolonged colds and coughs, attacks of chronic laryngitis, etc. The appearance of health is too readily accepted as a warranty of neglect. Elders in the family who are known to be chronic sufferers from 'bronchitis', 'asthma' or 'catarrh' are not suspected of being ill with pulmonary tuberculosis. A chronic cough is attributed to overindulgence in cigarettes. An acute debilitating illness is callously labelled 'influenza'. In all such matters the physician is the family's mentor.

Once the physician has arrived at a diagnosis of tuberculosis he must offer the patient an acceptable plan of treatment.

The question of sanatorium versus home treatment will be raised by the patient and must be solved by the physician. The treatment of tuberculosis during the important period following the diagnosis will be favorably influenced by sanatorium care since the patient will have a better opportunity to rest without the constant solicitations of worried relatives and friends. The sanatorium, in addition to being the most likely place where approved therapeutic methods are available under trained medical, surgical and nursing personnel, is to be considered a training school for patients. They will learn not only how to get well, but also how to stay well. Though the period of sanatorium care is abbreviated because of finances in the case of private institutions or shortened because of the long waiting lists of municipal, county and state institutions, this early period of instruction will provide the patients with a background satisfactory for continuing their treatment at home where they will be prepared to exercise precautions that will not only contribute to the restoration of their own health, but will also serve to prevent the spread of the disease to the healthy members of the household.

It might be of interest to mention that the

recent studies of Drolet have suggested namely, that pneumothorax and other surgical methods, though serving to prevent the progress of the tuberculous process by lessening the chances of spread, are to be considered no adequate substitute for the complete physiological rest of long periods in bed. Even though 80% of the patients in sanatoria are still advanced cases, the regimen of the sanatorium offers the patients with the minimal lesion optimal conditions for permanent arrestment or cure.

Any plan of treatment must take into consideration the patient's eventual rehabilitation. At the present time, the various health resorts specializing in the treatment of tuberculosis are attempting to build teaching institutions that propose to divert the interests of the patients into channels that may prove profitable once their disease becomes arrested. It is for the advanced cases who live with the ever present hazard of a relapse that such a service is to prove of permanent benefit. Those early and moderately advanced cases that are promised the possibility of an arrested disease choose to return to their former fields of activity, if possible.

The increasing frequency of early diagnosis to be realized by close follow-up examinations of contacts will serve to augment the numbers of this latter group. Larger institutions offering teaching facilities to children so that their elementary education may not be neglected are increasing in number. Too much attention paid to the development of the patient's intellect and ambition frequently prolongs the period of treatment.

The physician is often faced with the problem of the refractory patient who refuses treatment when the diagnosis of tuberculosis is made and persists in working even though he is usually ignorant of the essential precautions to be taken in preventing the spread of the infection to his associates and contacts. Some communities have solved the problem by coercing the patient to accept hospitalization and segregation. This becomes very important where children are members of the household, or where the patient's work exposes children to the likelihood of infection.

Patients who cooperate in treatment and particularly those who frankly acknowledge the fact that they have tuberculosis are the

patients most likely to attain arrestment of their disease. The migratory patient who considers the freedom from responsibility, which the treatment of tuberculosis aims to promote as an opportunity for unrestrained wanderlust and who moves restlessly from institution to institution, has himself to blame for the progress of his disease.

The progressive sanatorium with an active

outpatient department can perform an important function in a community as an integrating agent collaborating with local, state and national medical organizations in publicizing facts about tuberculosis, in formulating and organizing local methods of tuberculosis control and treatment, and in serving as a teaching institution for the physicians in its vicinity.

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An Observation on Pulmonary Tuberculosis When Complicated by Laryngeal Tuberculosis

A Preliminary Report

S C DAVIS, M.D., F.A.C.P., and REDFORD A. WILSON, M.D., F.A.C.P.
Tucson, Arizona

THE picture of a far advanced pulmonary tuberculosis with tuberculous ulceration in and around the larynx as a complication is too familiar to warrant discussion. The patient who has had cavitation, cough, and positive sputum for many years often has the infection implanted on laryngeal structures finally. In addition to the pulmonary symptoms, he then has hoarseness, painful deglutition, a continuous "sore throat," and evidence, often, of more marked toxicity subjectively. Examination shows the characteristic findings of laryngeal tuberculosis in addition to the chest findings.

It is not our purpose to discuss this type of lesion in this preliminary report. We propose, however, to submit an observation which, as far as we can learn, has appeared very rarely in American literature.

Some years ago, one of us (S.C.D.) observed that there is a type of pulmonary tuberculosis which has a characteristic appearance on the x-ray film. The type with this characteristic appearance is almost invariably associated with a tuberculous involvement of the larynx. The roentgenogram is so characteristic that, when one is familiar with it, one suspects laryngeal involvement from the study of the chest film alone, and this suspicion proves correct in most instances.

More often than not, the patients with this

type of lesion present themselves for examination first because of throat symptoms, being unaware of any pulmonary disorder. They usually complain of sore throat or protracted hoarseness. The hoarseness often is not accompanied by pain and often there is no cough or sputum. Frequently there is no history suggestive of pulmonary disease. The suggestion of tuberculosis comes from the laryngologist, who sees the tuberculous lesion at his examination, and the roentgenogram shows shadows characteristic of the type of disease under discussion.

Description of this characteristic appearance of the roentgenogram is difficult. The lesion is almost always bilateral, there is, usually, a very fine generalized mottling, which is best described as having a "ground-glass" appearance. There is rarely definite cavitation. There is not the snow-flake appearance of the familiar acute exudative lesion, nor the strands and mottling of the proliferative type. The appearance is as though there were a lobar pneumonia with all its density erased and only the fine, diffuse network remaining. Observation of the films tells much more than verbal description possibly can, and is the only way in which the appearance can be appreciated.

We have long since believed that the best treatment of the old, well-recognized type is to direct attention primarily to the pulmonary lesion. This, of course, is best accom-

* Thomas-Davis Clinic, Tucson, Arizona.

plished by appropriate collapse therapy. The improvement in the throat is usually in direct proportion to the improvement in the chest. The foregoing is not true in the type of tuberculosis just described. From our experience we have gained the impression that collapse measures in these patients is contraindicated. While our series is too small to warrant any definite conclusions, we have found that the cases treated by collapse measures, and especially by pneumothorax, have done very badly. This, of course, must be considered together with the fact that prognosis in this type of case is very poor at best.

Brief histories of typical, representative cases will be presented with their x-rays.

Case No 4847—Mrs P Age 44 First examined by us March 25, 1933. She had an acute cold, pleurisy and signs of pulmonary tuberculosis. X-ray showed minimal lesions of the type under discussion (See in Fig I). She spent some two months on rest and improved very noticeably. Following this, she would not co-operate, and went about her duties as housewife. For the month before second examination (11-6-33), she developed painful throat, marked hoarseness, and dysphagia, also, more cough than usual, loss of weight and strength, and fever. On examination, her temperature was 100°, pulse 104, blood pressure 100/74. Patient poorly nourished, pale, very hoarse. Examination of chest negative, without cough, after cough, showers of fine and medium rales throughout on right, apex to 4th interspace anteriorly and apex to lower border of scapula posteriorly on left. Larynx showed definite tuberculous ulceration. Sedimentation rate 113 mm per hour. X-ray, at both examinations, was typical of tuberculosis that gives laryngeal lesions. She was given pneumothorax on right (December, 1933), with a good collapse, but grew progressively worse. The throat grew worse proportionately. She developed pleural fluid very rapidly, and aspiration failed to cause any improvement. Death followed on February 2, 1934.

Case No A-1186—Mrs G Age 31 Seen by us November 14, 1934. Onset tuberculosis August, 1933. History uncertain as to onset of laryngeal disease. Course of pulmonary disease has been progressive. Examination of patient temperature 99.6°, pulse 120, blood pressure 108/70. Pale, emaciated, hoarse.

Larynx showed tuberculous ulceration. Chest—fine and medium rales throughout both lung fields. Sedimentation rate 154. Condition grew progressively worse. Apparently had an acute exacerbation of lung condition on 2-25-35. She had temporary phrenic interruption on left on March 5, 1935. Her course was unsatisfactory, pulmonary and laryngeal lesions progressing. In April she returned to her home and no definite information regarding her condition is available. X-ray shows lesion which is typical of those found with tuberculous larynx (See Fig II). From it alone, tuberculous infection in the larynx was suspected before the larynx was examined.

Case No A-731—Mr W Age 38 Seen by us October 23, 1934. Patient came to the clinic primarily for examination and treatment of his throat. Onset in 1931 with hoarseness. Diagnosis of tuberculous larynx was made and he was advised that he had practically no trouble in the lungs. This apparently was due to failure to recognize the markings of this type of lesion by x-ray when the disease was early. He was treated in a sanatorium nine months and discharged as cured. He went to work fourteen months after onset of disease. He worked eight months, when the hoarseness recurred, but he continued working for thirteen months more. He came to Arizona September 9, 1934, and began taking sun baths immediately. He was not aware of an increase in temperature following the sun baths, but stated that they made him feel worse. Examination of patient temperature 99.4°, pulse 120, blood pressure 112/88. Patient emaciated. Chest—left lung bronchovesicular breath sounds over upper portion with rales from 2d to 5th ribs anteriorly and suprascapular region posteriorly. Right lung bronchovesicular breath sounds over upper portion. Rales from apex to 3d rib anteriorly and suprascapular region posteriorly. Examination of larynx showed a tuberculous ulcer below left vocal cord. Right vocal cord markedly edematous. Sedimentation rate 51. Sputum had been consistently negative for many months. Was positive in October, 1934. His course was consistently downward until he left for his home in Ohio in February, 1935. It was learned that he died during the year. X-ray film showed typical findings (Fig III).

Comment

We have some thirty-odd cases in our series which show the type of roentgenogram we are discussing, from the thirty-odd cases, we have selected three which are considered representative. From these cases two facts appear evident: (1) Cases with these characteristic roentgenographic appearances have an associated tuberculous laryngeal lesion present in practically all instances. (2) These cases have an inherently bad prognosis, and they do so badly under collapse therapy that we believe collapse therapy may be contraindicated in this type of case.

The first fact was pointed out above. The diffuse, glazed appearance of the pathology in the x-ray film is, in itself, sufficient to make one suspect laryngeal involvement without knowing anything further about the

case

We feel that we have seen a sufficient number of these cases to have gotten the impression that these patients do poorly under collapse therapy. They almost always die of progressing tuberculosis, regardless of treatment, and this outcome seems to be hastened by any form of collapse, especially pneumothorax.

In this preliminary report, we have made no attempt to explain the cause of this characteristic appearance of the roentgenogram, or the reason for the larynx being involved so frequently in cases presenting this type of chest film. It is to be hoped that this report will stimulate interest in the question and that others will look for these cases. We hope to submit a further report when more cases are available.

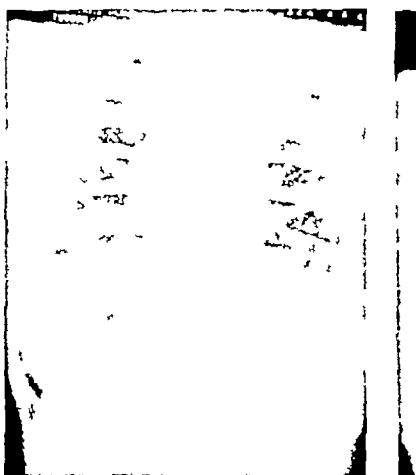


FIG I — Case 1

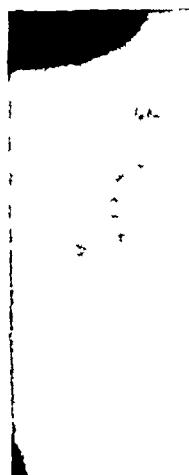


FIG II — Case 2



FIG III — Case 3

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**P. W. A. Approves Grants for
NEW TUBERCULOSIS BUILDINGS**

Georgia State Sanatorium
Texas State Sanatorium
Jefferson County Sanatorium
Western N C State Sanatorium
Broadlawns Sanatorium
Julius Marks Sanatorium
Chambers County Sanatorium
Blue Ridge Sanatorium
Pinecrest Sanitarium
McRae Memorial Hospital

	<i>Total Cost</i>
Alto, Georgia	\$387,000
Sanatorium, Texas	55,000
Birmingham, Alabama	154,000
Black Mountain, N C	24,300
Des Moines, Iowa	150,000
Lexington, Kentucky	85,000
Lafayette, Alabama	50,000
Charlottesville, Va	372,725
Charleston, W Va	200,000
Alexander, Arkansas	250,000

A Resume of

The Treatment of Tuberculosis in the Kerrville State Sanatorium for Negroes Kerrville, Texas *

H Y SWAYZE, MD **

Kerrville Texas

DIFFERENT sanatoria have different ways of treatment, but as a whole the treatment is about the same, also the results. The patient in the sanatorium can be controlled much more easily than in the home because everyone is doing the same thing as a rule and under the same circumstances.

Bed rest, fresh air and good wholesome food is the foundation, together with proper observation and care. Our routine in regard to a new patient is to put him to bed and on the following day make an examination, unless there should be some good reason for putting it off. The reason we do not like to make the examination immediately upon entrance is that the patient has come into a new environment and is usually under a heavy strain. After he has been with us a few days the scare has left him and we try to find out all we can respecting his idiosyncrasies, as we doctors all know, the idiosyncrasies of the patient has a great deal to do with the treatment. After getting a full history from him, together with x-ray and physical examination, he is turned over to the technician for sputum, blood, urine and, quite often, a Kahn test. Often the patient is put to bed and kept there, if in our judgement he should be. Should the examination show only a moderately advanced tuberculosis, we allow him to come to the dining room for meals and by keeping in close touch with him, we can easily detect any changes for the worse and put him strictly to bed and keep him there until all untoward symptoms have subsided.

Our rest periods are from 9:00 a.m. until 11:00 a.m. and from 1:00 p.m. until 4:30 p.m. During this time he is not allowed to read,

write or talk and is instructed to keep as quiet as possible. Many put a dark cloth over their eyes while resting, which is a great help towards keeping them quiet. We do not allow windows closed until the weather is very severe. He soon learns to enjoy the fresh air after he has become accustomed to resting and sleeping in the open.

We feed all patients three times a day and at the same hours each day. We serve a balanced ration and milk is the foundation of all tuberculous patients, as without milk it is hard to keep the patient's weight up and, as a rule, as long as he is taking on flesh he is doing well. We do not allow eating in between meals unless the patient is very sick, we then put him on a soft diet, together with fruit juices and also allow him to take fruit after the night meal, provided he cares to. Should he be allowed to eat any time during the day, it would only be a short time before stomach troubles began, and the stomach is certainly a sheet anchor in treating tuberculosis. We do not use very much medicine in treating tuberculosis, although we are compelled to give quite a lot for other troubles, especially in constipation, pleurisy and other minor conditions that may arise.

Psychology goes a long way in keeping the patient's morale up and I am sure that without it we would have rather a hard time treating the disease. We try to keep the patient's confidence and always stand ready to take all the time it may require in explaining any questions the patient may ask. The patient should be told when he has tuberculosis although there is no need to tell him how much involvement there is. Neither should he be told how long it will take him to get well, for if you tell the patient he is in for six months or a few years, it is certainly bad for his morale. So its just as well to "straddle the fence" and as a rule he is satisfied.

In the treatment of hemoptysis, we keep

* Read before the Lone Star State Medical Dental and Pharmaceutical Association at their State Meeting held June 14, 15 and 16, 1938

** Superintendent and Medical Director of the Kerrville State Sanatorium for Negroes, Kerrville, Texas

the patient quiet to the best of our ability Should the hemorrhage only be light, we try to talk him into thinking all is well Should it be quite large, we give by hypodermic $\frac{1}{4}$ gr morphine, which is a great help in quieting the patient and also in checking the cough Fibrogen subcutaneous and ice bag on chest and throat are used, but apparently all the benefit I have had with them is to quiet the patient Artificial pneumothorax, provided there are not too many adhesions, is the only remedy that we have found that will absolutely check a hemorrhage

Fever of tuberculous patients, as a rule, is easily controlled and it is not often that it annoys the patient to a very great extent When it rises above a hundred, we give some antipyretic as often as is needed An ice bag is also refreshing and allows the patient to rest better Alcohol rubs at night are very refreshing to the far advanced cases

Artificial pneumothorax is truly a boon to the tuberculous patient, as cases in which it can be used show wonderful results We now have at the Kerrville State Sanatorium thirty five unilateral and two bilateral pneumothorax cases When we find adhesions, we do a phrenicectomy and so far have gotten very

good results With a bilateral pneumothorax, we try to collapse the lung with the most involvement first and if we are successful in the operation, in about two or three months, unless the opposite lung is improving nicely, we collapse it—but very gradually If the operator keeps the bi-lateral case under close observation, all is well, but woe unto him who does not While all pneumothorax patients do not develop fluid, a large percentage do and it has been our experience that it is better to let well enough alone and if no bad symptoms arise, we do not disturb, but only aspirate when necessary

For cough we use the modern cough medicine, but are sometimes compelled to give codeine in large doses We try to teach the patient to control cough and in many cases get good results

When a patient's time has expired, or at any time that he sees fit to go home, I take him into the office where we can have plenty of time and instruct him in the way he should live, how he should eat, rest and exercise Many seem to be glad to get the instructions and promise to carry them out I hear from many of them and they tell me they are following the instructions given

The Meeting of Southern Tuberculosis Conference And Southern Sanatorium Association

The annual meeting of the Southern Tuberculosis Conference and Southern Sanatorium was held at the Brown Hotel in Louisville, Kentucky, September 19th to 21st Both the medical and sociological sections were well attended and many excellent papers were presented

In addition to its own membership, the Conference was fortunate in having at its meeting Dr Irvin Abel, president of the American Medical Association, Dr Chesley Bush, president of the National Tuberculosis Association, Dr Kendall Emerson, Managing Director of the National Tuberculosis Association, and Dr A T McCormack, Health Officer of Kentucky and president of the American Public Health Association, all of these gentlemen spoke, and spoke well

It is difficult from a galaxy of excellent papers, the titles of which were printed in last month's issue of DISEASES OF THE CHEST, to select the outstanding features Three widely divergent topics appealed most to this reviewer Dr John Alexander, of Ann Arbor, Michigan, gave a wonderful talk on "The Role of Lobectomy and

Pneumonectomy in Bronchiectasis and Carcinoma of the Lung" The lucidity of Dr Alexander's presentation, the clear sequential logic of his argument, the carefully selected slides to illustrate his points, together with his personal charm in giving his talk, made it one of the most interesting discussions of the entire session

The speech of Dr Irvin Abel, president of the American Medical Association, was also intensely interesting, presenting as it did in crystallized form, the results of the deliberations of the call meeting of the House of Delegates to discuss the question of the Government's attitude toward the medical profession, and to take certain steps to get in harmony with Washington From Dr Abel's talk, it was evident that the A M A had gone more than half way in meeting the wishes of the Federal Government and that much is to be expected toward the harmonization of government and medicine at the coming meeting between appointees from Washington and those from the A. M. A

Charming in its originality was Dr Lewis Moor-
(Continued to page 32)

Pneumolysis in the Treatment of Pulmonary Tuberculosis

LEO F HALL, MD, FACP
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CLOSED intrapleural pneumolysis is the surgical division of pleural adhesions under thoracoscopic observation or control. While intrapleural pneumolysis is not of itself a method of treating pulmonary tuberculosis directly, it is an aid in establishing adequate collapse of a diseased lung in which the objective of pneumothorax is being defeated by pleural adhesions.

The paramount objective of pneumothorax is collapse — adequate to produce localized rest, close cavities, prevent spread, reduce toxemia and expectoration. If adhesions prevent this "adequate collapse", it is here that closed intrapleural pneumolysis finds its usefulness. For by the division of adhesions, an inadequate collapse may be converted into adequate collapse, or the lung released from the thoracic cage.

Various authors estimate different percentages of divisible adhesions. One author states—"fifty per cent of pneumothorax cases have adhesions and fifty per cent of these are suitable for pneumolysis," while another author states—"when adhesions cannot be ruptured or stretched there remain about seven per cent of pneumothorax patients with isolated adhesions which are suitable for surgical division."

The Adhesions

The classification of pleural adhesions would be next to impossible since nature fashions them to suit herself and one may see strings, cords, bands, funnels, capstans, curtains, triangulairs, rectangulairs, etc. The fluoroscope and stereoscopic roentgenograms are the best pre-operative guides to the selection of what appears to be suitable or operable cases. However, not until the thoracoscope has been introduced into the chest and the surgeon has inspected the adhesions can he be certain as to their number, dimensions, locations, vascularity, attachment, size, or shape.

X-Ray

There should be sufficient pneumothorax space to permit the manipulation of instruments within the pleural space. Also, the adhesions must be long enough and small enough for division—that is, at least 2 cm in length.

Indications

Pneumolysis is indicated where we find an inadequately compressed lesion or cavity, due to pleural adhesions, and not responding to pneumothorax or a phrenic operation. Another indication is adhesions which cause the patient to have hemoptysis, severe pain, or cough. And thirdly, adhesions producing tension upon a portion of the lung that previously contained an open cavity, point definitely to pneumolysis.

Contra-Indications

When, however, conditions such as rapid formation of temporary pleural effusions, adhesions shorter than 2 cm, empyema, of a tuberculous or mixed pyogenic origin, progressive obliterative pleuritis, or tubercles on the pleura are found, pneumolysis should not be considered.

Instruments and Currents

Two general types of instruments are available for the operation:

- 1—The single puncture instrument, in which the telescope and cutting electrodes are included in the same instrument, so that the procedure can be carried out through a single puncture of the chest wall.
- 2—The double puncture instrument, requiring two trocar punctures into the chest. One for the telescope and light carrier, the other for the cautery electrode. The two-puncture instruments in general make use of the Galvanic cautery, while the single puncture instruments use high

frequency current (Elector surgical) The two-puncture instrument is used by the author

Preparation of the Patient and Pressure

On the afternoon before the operation, the chest and arm are scrubbed with soap and water, sponged off with alcohol and ether, painted with tincture of metrthiolate, and dressed with sterile towels At the operation the procedure is repeated, except that soap and water are omitted No breakfast should be given

Anesthetic

While a few surgeons use general anesthesia, the majority of operators use an opiate combined with infiltration anesthesia for the introduction of the trocars

We use 3 grains of sodium amyital (orally) two hours before operation, three grains, one hour before operation, 1-32 grain of dilaudid (hypodermically) thirty minutes before operation A sufficient amount of $\frac{1}{2}\%$ metycain is used to infiltrate the tissues and parietal pleura for introduction of the trocars

The patient is usually placed on the back, slightly rotated to the non-operative side, with the head and upper part of the chest moderately elevated

Introduction of Instruments after Draping Patient

The first trocar and cannula should be introduced on the anterior aspect of the chest in the second or third interspace, lateral to the compressed lung and below the adhesions to be severed The introduction is simplified by a small skin incision just sufficient to admit the trocar The cannula in place, the trocar removed, the light carrier is introduced, and then the telescope The pleural cavity is inspected and adhesions studied for the proper place to introduce the second trocar and cannula The site chosen can be transilluminated by the instrument within the chest and the cannula inserted, which is usually done in the axillary line, but is somewhat dependent upon the location of the adhesions

Severance of Adhesions

The cord and band-like adhesions are usually most readily sectioned, particularly if

elongated Extensive, broad, short or membranous adhesions whose appearance suggest that they may contain lung tissue, large blood vessels, or cavities, should be avoided and, if divided, only with extreme caution When broad adhesions are attempted, multiple stages should be done All adhesions should be divided close to the thoracic wall

Narrow and long string-like adhesions are readily sectioned by applying the cutting edge of the cautery tip at the parietal insertion The current is then switched on coagulating first, as indicated by a white color of the tissues, then readily severed The cautery should remain still during the process, allowing the adhesion to cut itself by tension, complete coagulation and absolute hemostasis are thus insured For the larger adhesions the flat surface of the cautery tip is first applied and the adhesion coagulated, the blade is then rotated so as to apply the cutting edge This being repeated as many times as necessary to complete the section

In large fan-like adhesions, an incision is made around the parietal insertion with the heated cautery The current is then turned off and the lung gradually and cautiously dissected away from the chest wall, by following the line of cleavage When the lung is sufficiently dissected, the current is switched on and the pleural layer incised This is known as Dr Coryllos' cold cautery technique

The instruments and trocars removed, the skin is closed by clips, skin massaged one minute and dressed with rubber sponge The pressure within the pleural cavity should be kept slightly positive or neutral for several days

Following the operation almost all cases develop a slight subcutaneous emphysema and some pleural effusion, both of which usually disappear A few develop empyema, tuberculous or of mixed types Pleural shock has occurred and two of the greatest dangers are the opening of a large blood vessel or pulmonary tissue

The incidence of serious post operative complications is almost in direct ratio to the shortness of the adhesions divided and in inverse ratio to the experience, skill and patience of the surgeon The greater proportion of short, broad adhesions one undertakes to divide the greater will be the incidence of

serious complications The results of the operation are therefore somewhat dependent upon the selection of suitable cases

The mortality from the procedures is 1% in 2000 cases studied The advantages of the operation are simply those of effective artificial pneumothorax, shortening the period of ineffective treatment When properly performed the operation is painless and does not usually produce shock Should the patient complain of pain, the adhesion may be infil-

trated with metycain

The operation, while simple, is not without potential danger, requiring effort, time, and patience on the part of the surgeon, with co-operation by the patient It should be used when the simpler methods fail The successive use of different collapse therapy procedures, when necessary, rather than limitation of treatment to a predetermined single minor or major operation, result in the highest percentage of arrested cases of tuberculosis

Bibliography *Collapse Therapy of Pulmonary Tuberculosis,*
John Alexander, Ann Arbor, Michigan
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Fig I Before operation

Fig II After operation

ACCEPTANCE FROM THE PHILIPPINE ISLANDS COMPLETES GOVERNORS FOR COLLEGE

With the acceptance from Dr Miguel Cañizares, elected Governor of the American College of Chest Physicians for the Philippine Islands, we announce the completion of the organization in the 44 states wherein the College has elected Governors, the District of Columbia, Porto Rico, Hawaii, Mexico, and the Philippine Islands

We are publishing the letter which has recently come from the Philippine Islands as representative of the fine spirit with which the Governors of the College are taking hold of their responsibilities The officers of the College have mapped out an ambitious program for this coming year, and the committees in charge of the program are calling upon the Governors of the College to assist them in carrying out their part of the program The Governors are responding wholeheartedly to the requests of the committees and through this fine organization much will be accomplished

August 25, 1938

Dr Champ H Holmes, President
American College of Chest Physicians
Atlanta, Georgia
My dear Dr Holmes

I have on hand yours of July 11, 1938 advising me that the American College of Chest Physicians has done me the singular honour of electing me Governor of the College for the Philippine Islands up to December of 1940 Allow me to express through your good office my gratitude for this great honour the College has bestowed upon me

Carrying as it does great responsibilities, I shall attempt to discharge them to the best of my ability and to carry out the principles and ideals on which the College was founded

Very sincerely yours,
MIGUEL CAÑIZARES,
Quezón Institute, Philippines

Recognition of Early Pulmonary Tuberculosis in Industry*

JAMES A. BRITTON, M.D.

Chicago Illinois

THE important community health problems are, incidentally, the important health problems of industry. This applies particularly to pulmonary tuberculosis. While there has been a marked reduction in the importance of the tuberculosis problem, both for industry and the community, in the last 30 years, it still retains its importance from the standpoint of disabilities which are long and serious. Thirty years ago there was little or no provision for discovering or caring for tuberculous individuals. There were no clinics, there were no sanatoria, nor was there routine physical examination for any purpose and particularly that for employment. The practice of making routine physical examinations only applied to a few such selected occupations as train service on railroads and for service in the army or navy.

Without attempting to evaluate the various factors which have entered into the reduction of the death rate from tuberculosis in Illinois in the last half century from 250 or more per hundred thousand to less than 60 per hundred thousand, we do know that our knowledge of the situation and our management of cases is greatly improved. At the beginning of the Twentieth century records available seemed to indicate that the incidence of tuberculosis among those employed in industry was approximately the same as that of the community. While the community death rate in Illinois from pulmonary tuberculosis is something less than 60 per hundred thousand at the present time, the tuberculosis death rate in many of our large industrial groups is less than one-fourth that of the community rate. The case rate of tuberculosis in industry is only slightly in excess of the death rate in the community. In recent studies made of large industrial groups, the death rate from pulmonary tu-

berculosis during the year 1937 was 14 per hundred thousand. The incidence during this same period, of known cases of pulmonary tuberculosis, was 80 per hundred thousand.

These figures correspond very closely to the general conception of those who have studied the tuberculosis problem, that for every known death from pulmonary tuberculosis there are from five to seven active cases in the community. It seems, then, that while we still have the problem of pulmonary tuberculosis among those employed in industrial establishments, the problem is not nearly so great as it was 30 years ago and that there has been a very definite change for the better by reducing the industrial rate from approximately equal to that of the community rate to less than one-fourth of the community rate.

Because of the fact that a lot of loose statements have been made regarding the unfavorable relation between employment in industry as such and the unfavorable effect upon the tuberculosis rate, it might not be out of place again to repeat statistics regarding the change in the tuberculosis death rate in large industrial centers. It might be well to note especially in this connection that the reduction in these large industrial centers in the tuberculosis rate has been more rapid than that in the states in which the industrial centers are located.

TUBERCULOSIS MORTALITY PER HUNDRED THOUSAND

	1900	1930
City	City	State
Louisville	211.5	60.2
Chicago	157.8	74
St. Louis	196.3	83
Detroit	113.0	68
Pittsburgh	133.7	69

* Read before the Nineteenth Annual Meeting of the Central States Society of Industrial Medicine and Surgery, Springfield, Illinois, May 17, 1938—Reprinted from *Industrial Medicine*, Vol. 7, No. 6, June, 1938.

Five years ago there was great excitement in this country about silicosis and silico-tuberculosis. At a public meeting in Wash-

ton two years ago no less a person than the Honorable Secretary of Labor stated in public that an investigation made for the Department of Labor had shown that at least 500,000 people in the United States were about to become disabled or were going to die of silicosis or silico-tuberculosis. The civil courts were being flooded with damage claims numbering thousands of cases and aggregating claims of millions of dollars for compensation. Since this hysterical period many health surveys have been made by competent authority. Recent statistics of thorough and careful surveys, at which time adequate x-ray chest plates have been made, in places like Chicago, Milwaukee, and more recently in New York State, show conclusively that while there are certain occupations in which silicosis may be produced and silicosis or silico-tuberculosis result in disability or death, the number of workmen involved and the number of jobs with serious potential hazards are very much smaller than was thought even two years ago. A survey of a large group of factory employees in Chicago was recently made. A large percentage of all those examined had been, or were, occupied in the so-called dusty trades. Counting everything that could be possibly interpreted as some evidence of lung change due to dust exposure, either clinical or x-ray, or both, counting every stage from earliest to the most advanced, the total number found of any degree, irrespective of whether there was disability or not, was less than 2%.

Beginning about 25 years ago, some of the larger industrial establishments started to examine applicants for employment before they were assigned to jobs. The fundamental purpose of this pre-employment examination was to assist in the choice of a man physically qualified for the particular job which he wished to do. Shortly after this pre-employment examination was established the practice of making periodic examinations of those already employed was also established. Following the lead of those who started this work 25 years ago it has become almost a universal practice in all except the smaller industrial establishments to more or less regularly carry out these two procedures. Within the last year or two these examinations have been made much more carefully than was prev-

iously done. The usual type of examination at the present time includes not only urinalysis and blood pressure, but also an x-ray chest plate. Needless to say, with the improvement in technique, the work now is much more accurate and satisfactory.

There has been considerable discussion about these physical examinations, both on the part of management and labor, and in some places objections have been raised to making any physical examinations at all. The objectors very frankly stated that they thought the theory of these examinations was excellent, but in some places these examinations were used for some other purpose than determining physical and mental fitness and because of this applicants for employment and those already employed were unfairly treated. The subject of mental "fitness" was broadened into mental "attitude"—attitude as exemplified by religion, politics and trade unionism. The obvious comment is that any physical examination that is made must, *first*, be well done and, *second*, the doctor making this examination must not abuse his privilege nor allow the knowledge of the man who is seeking employment or who is already employed honesty and fairness and characterize this work or it cannot continue.

There are two or three interesting points in the plan of procedure in making physical examinations. It is a well known fact that wherever there is a rapid increase in the number of employees of an industrial establishment, due to the pressure of increasing business, it regularly happens that a considerable percentage of those put to work, subsequently, within the next few days drop out because they do not like the work or because they or the employer find they are not qualified for the job which the employment department thought they were. It has been argued that there is a large amount of wasted effort in making pre-employment examinations of everyone before they actually go to work. In fact it has been the practice in some industries to wait a few days or a month or so before making this examination, the argument being that if the plant physician waits this short interval he only has to examine those where it is reasonably certain that they will remain on the job.

It is my personal opinion that such a pre-

cedure is not fair either to the employee or to the management. It is very embarrassing and frequently the subject of considerable argument, if a man has been allowed to work a few days or a month, finds that he likes the job and can perform it to the satisfaction of his foreman, and then is physically examined and it is found that he has some physical defect or disease which disqualifies him for employment. It is believed that reasons for rejection are hard enough "to take" under any circumstances, and that in fairness to the man he should be told before he actually goes to work, whether or not he is physically qualified.

The plan of periodic physical examination of those already employed has been the subject of a great many comments. Without going into an elaborate argument about the reasons for the plan, my personal opinion is that all employees, whether they are executives or common laborers, should have a complete examination no less often than once in three years. Supplementing this, those who are in responsible positions, those who manage or direct others, should be examined at least once a year. Then in addition to this, all employees who are subjected to a known occupational hazard of any degree should be examined more often than once a year. If employees are subjected to a known poison, then according to some of the state laws, it is necessary to check the physical condition of this group once a month. In a word then, the schedule of examination should be, *first*, everybody at least once in three years, *second*, those in responsible positions once a year, *third*, those who are subjected to occupational hazards of any degree, frequently enough to keep a constant check on the effect of the exposure.

As previously stated, records of disability and death, because of tuberculosis, in large groups of industrial employees, have shown a disability rate of about 80 per hundred thousand and a death rate of 14 per hundred thousand employees. This does not include those who have evidence of tuberculosis, either old or recent, but who have not as yet developed disability. On careful examination, including chest x-ray, of large numbers of those applying for work, there were some clinical or x-ray signs of pulmonary tubercu-

losis in 2 4%, of those already employed there were clinical or x-ray signs of tuberculosis, but no symptoms, in 1 9%.

If we compare the cases where there is a clinically active pulmonary tuberculosis with the number which are found to be working who have x-ray or physical signs of some inactive tuberculosis, we find that for every clinically active case there are 25 who are regularly working and in spite of having x-ray or physical evidence of some old pulmonary tuberculosis they do not have any evidence of active disease. Experience has shown that only a very few of those of this group who are classified as having x-ray signs of some pulmonary tuberculosis, as discovered in this type of routine periodic examination, ever developed an active pulmonary tuberculosis. This fact is very important because there has been an outspoken opinion on the part of many managers, on the part of some industrial physicians and even fellow employees, that if tuberculosis is discovered in such an x-ray examination sooner or later active tuberculosis will develop and such an individual is always a potential hazard. Such an attitude has resulted disastrously for a good many men who are well placed and working well within their physical limits. This phthisiophobia should have prayerful consideration wherever a group of industrial physicians are gathered together. We must learn to distinguish between the man who has active pulmonary tuberculosis with positive sputum, an active pulmonary tuberculosis but without positive sputum, and "x-ray" pulmonary tuberculosis where the individual is in good physical condition and working at a job which means the difference between economic independence and insecurity. As physicians, irrespective of whether we have any interest in industrial work, we should ever keep in mind that the best preventive for tuberculosis is a regular job in a fairly decent working place with a regular pay check and the possibility of a decent place to live and regular meals.

The disposition of the cases of tuberculosis—speaking of them in the all-inclusive term—whether active, quiescent, or entirely asymptomatic, should be given careful thought. I think we all can agree that where a man has an active tuberculosis with a posi-

tive sputum, he is a sick individual and should not be passed as an applicant for any job, and if he is employed he should stop work both for his own sake and for the safety of fellow workmen An applicant, who from physical examination and x-ray is thought to have a tuberculosis which is not completely arrested, even if there is a negative sputum, should usually be placed in the same classification as the proved active case A man who is employed, however, may frequently be allowed to work under supervision at his usual occupation, or some modification of his usual occupation, without endangering his own safety or that of his fellows An applicant who has an old inactive tuberculosis should not always be rejected for employment Many such individuals can work at some self-supporting occupation with considerable benefit to themselves, their families and the community Such an individual, however, should not be given employment which calls for excessive muscular effort nor should he be employed where he is exposed to a known occupational hazard If such an individual is already employed and he has demonstrated that he is able to remain without symptoms at his usual occupation, it is seldom if ever necessary to disturb him unless he is in a known hazardous occupation in which it might be possible for his old, latent disease to become reactivated by continued occupational exposure

We now come to the problem of the employee who was compelled to quit work because of active tuberculosis and after a period of effective treatment at home or in a sanatorium is now ready to return to some regular work It used to be taught that such an individual should only work out of doors—should seek an occupation in which he was more or less constantly in the open air This idea is usually absurd, and most often it results in subsequent breakdown of the individual If one stops to think, the exposure to the weather with the frequent and sudden changes in temperature and humidity and the laborious character of the work usually available in an outside job—the combination is anything but a satisfactory one for the tuberculous individual The old cry used to be for a light outside job Observation has shown that about the only light thing about an out-

side job is the pay The experience of all of us who have dealt with cases of tuberculosis for years has been that the returned tuberculosis case does better at the job which he knows, the job for which he has been trained, possibly by long years of experience, the one that he does with the least effort and, incidentally, pays him the best wages It is possible that his old job must be modified somewhat, but in view of modern standards of hours per day and days per week we must not fail to remember that the time off duty each day is usually 16 hours, and in addition to this there are usually two full days each week in which there is no work.

This should convince us that unless there is something inherently wrong with the old job the ex-sanatorium patient, if he is able to work at all, can get by very well if he limits his activities to the working hours alone Various attempts all over the country have been made to return the individual with an arrested tuberculosis to an especially selected job All sorts of attempts have been made in various parts of the country and most of them have not proved very satisfactory

On the other hand, it is true that any doctor who is familiar with the problem finds that he has quite a large percentage of the returned cases going along very well, year after year, on their old jobs

If we wish to understand all the factors incident to the tuberculosis problem in industry we must not forget the determining factors in the development of any case of tuberculosis, under any circumstances In spite of the fact that there is some evidence that adults occasionally acquire a primary infection after reaching adult life, it is still true that the great majority of all positive cases of pulmonary tuberculosis can be traced back to exposure in childhood It is still true that in 100 consecutive cases of active pulmonary tuberculosis there is a positive history, in at least 50% of the cases of a direct exposure to a tuberculous mother, father, brother, sister, or some adult in the immediate family We must not forget that living and personal habits have a great influence in determining whether or not a comparatively slight, old, latent infection becomes reactivated We must also remember that working habits, not the working place or the occupa-

tion, have an important bearing. For example, in our medical schools the tuberculosis rate among students who have been carefully selected, is much higher than that in the community. The explanation for this high rate among medical students is not that they have any unusual exposure in their classrooms or in their clinics, but modern educational practices in this field are so intense that medical students habitually, and over a long period of months and years, fail to get the adequate rest that young individuals require. There are very few jobs in which there is an exposure that is directly responsible for the activation of a tuberculosis, but most any job might be the determining factor. It is not the job itself, but the way that it is done that is important.

We have had a great deal of publicity on the question of industrial exposure as the determining factor in the development of tuberculosis. There has been a lot of "scare-head" publicity as to the enormous numbers of men who are subjected to such an exposure. Sober thought and careful investigation have shown that the importance of this type of industrial disease exposure has been greatly over-estimated.

Perhaps the outstanding factor in the development of tuberculosis is the economic status of the individual or his family. If a group of individuals have fairly decent jobs and work under fairly sanitary conditions and get a fair regular wage, it means that the majority of the individuals in this group will live regular lives in decent surroundings and their food, clothing and shelter are adequate. A group of individuals such as this usually has a very low tuberculosis rate, irrespective of the type of industry at which they are employed. If, on the other hand, a job is irregular, the working place is not very sanitary and the pay is the minimum, any group, depending on such jobs for a livelihood is bound to live poorly in unsatisfactory surroundings. We use the words susceptible and immune and yet no one knows exactly what susceptibility or immunity is. We ordinarily think of the colored race as being especially

susceptible to tuberculosis. This is possibly true, but only in a measure. The most important factor in this race susceptibility is that such individuals are at the bottom of the economic scale and jobs are irregular and the pay poor. They live miserably, and all of the problems incident to health because of such living are emphasized. Even the so-called more immune will have a high tuberculosis rate under like circumstances.

I suppose all of you have been tremendously interested in Drolet's paper in the *American Review of Tuberculosis* for February, 1938, on the trends in tuberculosis. He shows by very comprehensive statistics for this country and England that the trend in the incidence of tuberculosis has been steadily downward. This means that the problem of tuberculosis in industry and in the country as a whole is gradually becoming less of a problem, and that in the future it will not be as difficult as it was in the past. Incidentally, however, in his paper he shows conclusively that where there are bona fide cases of active tuberculosis the results of treatment, irrespective of where or how, have not been very satisfactory. In other words, the hopeful sign is steady reduction in the number of cases and not what happens to those who actually develop the disease. Progress has come by prevention and not through treatment. The problem today is still important, but no longer of major importance. Any industry that has a trained medical staff and a fairly comprehensive plan for medical supervision can expect a steadily decreasing tuberculosis rate. The enormous number of routine chest plates that are being taken at the present time allow us to judge the relative importance of individual cases and the value of the contributory factors in the development of tuberculosis and how best to modify or control these factors. Knowledge of how to prevent tuberculosis in industry has come through persistent study of the employees and working places and their occupational hazards. The job is not yet finished, our methods of elimination and control have proved satisfactory, they should be continued.

Tuberculosis Program
 Convention of Pennsylvania State Medical
 Society
 SCRANTON, PENNSYLVANIA

THURSDAY, October 6th, was Tuberculosis Day at the Convention of the Medical Society of the State of Pennsylvania

Doctor Julius L Wilson, formerly associated with Doctor Soper of New Haven, and recently appointed head of the Department of Thoracic Diseases of Tulane University, presented Pathology, Symptoms, and Diagnosis of Pulmonary Tuberculosis, followed by a discussion of the Treatment of Pulmonary Tuberculosis by Doctor Frank Walton Burge, of Philadelphia. Lantern slides of Pneumoperitoneum were shown

Following the lectures, a Tuberculosis Round Table was held. Round Table discussions were inaugurated this year for the first time in the history of the Scientific Programs of the Medical Societies of the State of Pennsylvania by Doctor Seth A Brumm, of Philadelphia, Chairman of Scientific Programs. The Tuberculosis Round Table officials were Doctors Julius L Wilson, Frank Walton Burge, Joseph W Post (x-ray), Esmond R Long (Pathology, Case Findings), and W Emory Burnett (Chest Surgery). Questions from the ninety physicians attending the Round Table were answered directly as they were presented. The questions were excellent and pertinent, and the Round Table was generally and enthusiastically hailed as the best method of presentation of medical material.

In the afternoon, the Pennsylvania Tuberculosis Society held its semi-annual Board Meeting, thereby bringing to Scranton important persons in Tuberculosis Work from all over the State, and so greatly helping toward the success of "Tuberculosis Day" in the Medical Society Convention. Arthur M Dewees, the able and progressive Executive Secretary of the Pennsylvania Tuberculosis Society, in arranging his Board Meeting at that time, gave his usual fine example of cooperation with and encouragement of, all Tuberculosis Agencies.

In the evening, a Tuberculosis Dinner was held under the auspices of the Tuberculosis Committee of the Medical Society of the State of Pennsylvania. Gathered at the dinner were the officials of the Pennsylvania Medical Societies, both Old School and Homeopathic, the Secretary of Health of the Commonwealth of Pennsylvania, Doctor Edith MacBride Dexter, and a number of her

leading Tuberculosis Officials, the President of the Pennsylvania Tuberculosis Society, Doctor William Devitt, and a number of other officials of that Society, Doctor Champneys H Holmes, President of the American College of Chest Physicians, and many of the Fellows of the College, were present.

Doctor Louis Clerf, Professor of Bronchoscopy of the Jefferson Medical College, was Toastmaster, any dinner would be a success with Louis Clerf Toastmaster. The speeches were all on the Pennsylvania Plan. It was universally endorsed. Doctor Dexter said it was no longer just a Plan—that the State Health Department was building homes for doctors on the sanatorium grounds, raising the Tuberculosis Sanatorium doctors' pay, doing away with patient labor in the sanatoria, as rapidly as possible, and building the finest sanatorium buildings any State has ever had.

Doctor Champneys H Holmes of Atlanta, Georgia, brought encouraging news of the spread of the Pennsylvania Plan in many other States. His heart was so in his theme that his speech was generally acclaimed "The finest oratory we have every heard." He stated that Doctor Ralph Matson of Portland, Oregon, was leading the movement throughout the Country.

Doctor Esmond R Long, gave words of deepest wisdom, lauded the Pennsylvania Plan, and called attention to one very important lack in the Plan, which is its failure to stress the importance of Case Finding Surveys in older age groups where the incidence is known to be high. He said, "Look for Tuberculosis where it is to be found." We will incorporate the above as advised.

Mr Arthur M Dewees brought a new plan of cooperation between the Pennsylvania Tuberculosis Society and the State Medical Society. "In the future," he said, "we will invite the Chairman of the State Society Tuberculosis Committee to be present at our Board Meetings."

Thus, is the Pennsylvania Plan, first endorsed by The American College of Chest Physicians, amalgamating Public Health Officials, The Great National Tuberculosis Association and its component societies, and the Forces within Organized Medicine, into one great Army, to give new battle to the White Plague.

The Attitude of the States to the Pennsylvania Plan*

CHAMP H HOLMES, M.D **

Atlanta Georgia

IN the good office of president of the American College of Chest Physicians, I share with your commonwealth the pride of this notable undertaking, for the College is a co-sponsor of the Pennsylvania Plan. Dr Frank Walton Burge has referred to it as the American College of Chest Physician's Plan. Under the warmth and shelter of its maternal wings, the idea has been fostered, nurtured and incubated. It is now emerging as a chrysalis from the pupa stage to wing its way into the sunlight—the sunlight of achievement.

I feel assured that all of you are familiar with the details of the Pennsylvania Plan. If not, the other speakers on the program will illumine and clarify it for you. My purported message to you pertains to the national attitude. The Pennsylvania Plan is as yet in an embryonic form, and, therefore, at this time, I can give you only trends and reactions, rather than figures and facts. Were this meeting just a few or several weeks hence, then I believe the latter would be more the complexion of this message.

In brief, the Pennsylvania Plan consists of the approach to, the control of and legislation for, the tuberculosis problem, by organized efforts within the ranks of the medical profession and in their own state and county medical societies. The whole program is to be carried out, as far as possible, under the auspices of the American College of Chest Physicians, of which body it is to constitute one of the major functions. And, what a laudable function it is, and what organization is better equipped for assuming it! There is in no sense any intention not to give full credit to the fine and splendid, the all important activities of the National Tuberculosis Association, for the Pennsylvania Plan or any other program of Tuberculosis control and prevention could not succeed without this

indispensable ally. It is, however, now being rather acutely, realized that the key man, the pivotal point in the whole tuberculosis structure, is the practicing physician. It is by, for and of him that the American College of Chest Physicians exists, and gives promise to flourish and flower down through the years.

To further and promote the Pennsylvania Plan, the College has created the Committee for the Advancement of Tuberculosis Organization in Medicine. Dr Ralph Matson of Portland, Oregon, and the incoming president of the College, is Chairman of this Committee. The members of this committee, to each of whom are assigned several states in his section of the country, are Dr Frank Burge of Philadelphia, Pennsylvania, Dr Louis Knoepp of Beaumont, Texas, Dr Fred Meixner of Peoria, Illinois, Dr Ed Murray of Lexington, Kentucky, Dr Paul Ringer of Asheville, North Carolina, Dr Fred Slyfield of Seattle, Washington, Dr Charles Trembley of Saranac Lake, New York and Dr William Voorsanger of San Francisco, California. All of these men are now active in this work, the organization's governors in each state are being contacted, and favorable reactions and results from over the whole nation are just now beginning to flow in. Many states at the present time have active tuberculosis committees. On most of them are Fellows of the American College of Chest Physicians, and in many instances they serve as chairmen. The transition here to the Pennsylvania Plan should be relatively easy, if not almost automatic. Many letters from outstanding phthisiologists over the country are in our files, displaying an enthusiasm or keen interest in the plan. Texas has already bodily launched upon a very similar plan, under the wise guidance of its helmsman, Dr R B Homan, Senior. So, in conclusion, it would seem that the Pennsylvania Plan is being heralded and welcomed over our nation, and will soon operate as a mighty agency in our age old struggle.

* Resume of paper delivered on the Tuberculosis Day Program of the Pennsylvania State Medical Society, October 6, 1930 Scranton, Pa.

** President, American College of Chest Physicians

Organization News

Committee on Scientific Programs

The Committee for the Advancement of Scientific Programs on Diseases of the Chest of the American College of Chest Physicians, announces its program for the coming year. Letters have been mailed to the forty nine Governors of the College outlining the following purposes of the committee and the procedure.

"The Committee for the Advancement of Scientific Programs on Chest Diseases of the American College of Chest Physicians desires to stimulate the reading of more papers on chest diseases before the meetings of the County, State, District, and the American Medical Association.

With the above objective in mind, we solicit your co-operation, in so far as possible, to assist the committee in carrying forward this program.

Will you please contact the program committee of your State and County Medical Societies and offer the assistance of this committee in arranging for speakers at their meetings. Wherever possible, we suggest that you recommend local Fellows of the American College of Chest Physicians to the program committees. If you do not have a local man available, please contact the member of the committee nearest to you, and he will be pleased to render as much assistance as possible.

Kindly notify the Editorial Offices of our monthly Journal, Diseases of the Chest, concerning arrangements made for speakers, so that we may list them and give the meetings some publicity in the columns of the journal. Whenever possible, the Editorial Board of Diseases of the Chest, will be pleased to publish the papers delivered at these meetings."

Submitted to the Governors of the American College of Chest Physicians by

Ralph C. Matson, M.D. John Alexander, M.D.
Chairman Vice-Chairman
Portland, Oregon Ann Arbor, Michigan

W. C. Breidenbach, M.D. James S. Edlin, M.D.
Dayton, Ohio New York, N.Y.

Jerome Head, M.D. Fred G. Holmes, M.D.
Chicago, Illinois Phoenix, Arizona

Harold G. Trimble, M.D. Wm. D. Tewksbury, M.D.
Oakland, California Washington, D.C.

The members of the Committee for the advancement of Scientific Programs on Diseases of the Chest will assist the Governors of the following states in putting the program into effect:

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Minnesota	Missouri
Nebraska	Iowa
Pennsylvania	Kansas
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Ralph C. Matson, M.D.

U.S. Possessions
Mexico

Committee on Nominations

Dr. Champ H. Holmes, President of the American College of Chest Physicians, announces the appointment of the following committee for the nominating of newly elected officers whose terms of office will expire in 1939.

Dr. Frank Walton Burge, Philadelphia, Pa.
Chairman

Dr. Edward W. Hayes, Monrovia, California
Vice-Chairman

Dr. Dean Cole, Richmond, Virginia

Dr. Charles Hartwell Cocke, Asheville, N.C.

Dr. George Foster Herben, Yonkers, N.Y.

Dr. H. I. Spector, St. Louis, Missouri

Dr. Harry Warren, San Francisco, Calif.

Fifth Annual Meeting

The American College of Chest Physicians will hold its Fifth Annual Meeting at St. Louis, May 13-14, 1939. The following committees are in charge of the arrangements:

Committee on General Arrangements

Dr. James L. Mudd, St. Louis, Chairman
Dr. Jesse E. Douglass, Webb City
Dr. Alfred Goldman, St. Louis
Dr. Sam H. Snyder, Kansas City

Committee on Scientific Programs

Dr. H. I. Spector, St. Louis, Chairman
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Dr. Elmer E. Glenn, Springfield
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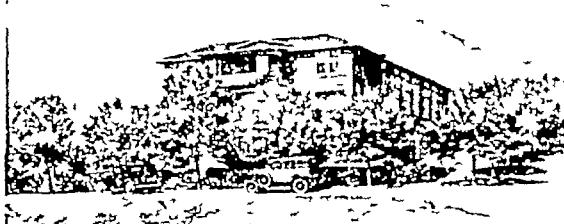
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Dr Andrew C Henske, St Louis, *Chairman*
 Dr Louis C Boisliniere, St Louis
 Dr William G Gunn, Versailles
 Dr Herbert L Mantz, Kansas City

The committees are at work on arrangements for the meeting and their progress will be published in these columns from time to time. Watch the Organization News columns for further developments

Elected President of Tuberculosis Conference

Dr H I Spector, St Louis, Missouri, Governor of the American College of Chest Physicians for the State of Missouri, was elected president of the Mississippi Valley Conference on Tuberculosis at the annual meeting of the conference held on September 23rd. On September 16th, Dr Spector was the guest speaker before the annual meeting of the Kansas State Tuberculosis and Health Society. He spoke on the subject of "Eradication of Tuberculosis". On September 22nd, he spoke before the joint meeting of the Mississippi Valley Conference on Tuberculosis and the Mississippi Valley Sanatorium Association on the subject, "Marital Tuberculosis", and on September 23rd, he read a paper on "Interpreting Symptoms and Diagnosis of Tuberculosis to the Every Day Citizens" before the Mississippi Valley Conference on Tuberculosis

Governor for Mexico Reports

Dr Donato G Alarcón, Mexico City, Mexico, Governor of the American College of Chest Physicians for Mexico, sends us the following communication: "A Postgraduate course on Pulmonary Tuberculosis was given during September at the Tuberculosis Sanatorium of the Public Welfare at Mexico City. Forty five physicians of the Republic attended the sessions. Subjects pertaining to the various phases of tuberculosis were presented. The main features this year were the new techniques on thoracoplasty, extrapleural pneumothorax, and pneumoperitoneum. All of the procedures were practically demonstrated."

Governor for Vermont

Dr Roscoe E Avery, Barre, Vermont, has been appointed as a Governor of the American College of Chest Physicians for the State of Vermont. He will serve for one year

SOCIETY NEWS

Dr Francis M Pottenger, Sr., Monrovia, California, Fellow of the American College of Chest Physicians, was the guest speaker before the annual meeting of the Santa Clara County Tuberculosis Association, at San Jose, California

Dr Victor S Randolph, Phoenix, Arizona, Regent of the American College of Chest Physicians, delivered a paper before the Third Harlow Brooks Navajo Memorial Clinical Conference held at Ganado, Arizona, August 29-31. The title of Dr Randolph's paper was, "Bronchography in Diagnosis of Pulmonary Disease"

Dr James A Redfearn, Albany, Georgia, Fellow of the American College of Chest Physicians, was on the program of the Tri-County Medical Society, composed of Calhoun, Early, and Miller Counties, held at Dorday's Mill, Georgia, August 18th. Dr Redfearn discussed "Heart Disease"

Dr Leo W Bortree, Colorado Springs, Colorado, Fellow of the American College of Chest Physicians was inducted into office as the president of the Colorado State Medical Society, at the annual meeting of the society held at Estes Park, Colorado, September 8, 1938. Dr Bortree's presidential address was concerned with, "Present Day Problems of the Medical Profession"

Dr John B Crouch, Colorado Springs, Colorado, Fellow of the American College of Chest Physicians, was named as the Chairman of the Committee on Tuberculosis Control of the Colorado State Medical Society. Dr Arnold Minnig, Denver, Colorado, Fellow of the American College of Chest Physicians has been designated as a member of the committee

Dr John H Peck, Oakdale, Iowa, Governor of the American College of Chest Physicians for the State of Iowa, was a guest speaker at the Post-graduate Course given at the Warden Hotel, Fort Dodge, Iowa, under the auspices of the Speakers Bureau of the Iowa State Medical Society, on October 18th. Dr Peck spoke on "Medical Treatment of Non-Tuberculous Diseases of the Lungs" *Society News*

Dr L D Phillips, Marshallton, Delaware, Governor of the American College of Chest Physicians for the state of Delaware, was on the program of the annual meeting of the Delaware State Medical Society, held at Wilmington, Delaware, on October 11-12. Dr Phillips discussed a paper presented by Dr David A Cooper of Philadelphia entitled, "The Indications for Surgery in the Treatment of Pulmonary Tuberculosis"

Dr Charles J Kaufman, Denver, Colorado, Governor of the American College of Chest Physicians for the State of Colorado, was on the program of the Rocky Mountain Tuberculosis Conference held at Salt Lake City, Utah, October 7-8. The title of Dr Kaufman's paper was, "Vocational Therapy in the Management of Pulmonary Tuberculosis"

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THE MEETING OF SOUTHERN TUBERCULOSIS
CONFERENCE (Continued from page 17)

man's informal talk on "Some Historical Aspects of Tuberculosis", showing as it did a profound knowledge of the subject and a familiarity with ancient traditions and mythology, both Greek and Roman, and with philosophy from Plato to Bergson, a philosophy which was handled with a delightfully light, and at times humorous, touch, but which when applied to the subject in hand showed what a tremendous in-

fluence tuberculosis has had on the course of empire

Emphasis upon these three presentations is not made in any sense to disparage many others which were of great excellence, but having been asked to give his idea of the high lights of the meeting, the writer was compelled to choose those that remained most strikingly fixed in his mind All in all, the meeting was considered a great success, and all who attended it are looking forward to the next gathering, which will be in Charleston, South Carolina in September, 1939

◆◆◆◆◆

In Memoriam

RICHARD HAYWARD MORGAN, M. D.

1881—1938

DR RICHARD HAYWARD MORGAN of Detroit, Fellow of The American College of Chest Physicians, died at his home on Wing Lake Road, Sunday morning, July 10, 1938

Dr Morgan was born in Albert Lea, Minnesota, June 28, 1881, the son of Darius F Morgan and Ella Hayward Morgan. He received his early education in the public schools of Minneapolis, Minnesota, and graduated in Medicine from the University of Michigan in 1908. Following his graduation, he entered private practice in Detroit, remaining there until 1910. From 1910 to 1912 he was resident physician at Castle Springs Sanitarium in Arizona, and from 1912 to 1917 he was on the medical staff of the Equitable Life Assurance Co in Chicago, Illinois.

Serving on the staff of Mount McGregor Sanitarium, New York, for ten years, he specialized in diseases of the chest, until in 1927 he was invited to Detroit by the City Board of Health. He assumed the Extramural Consultation Service in Tuberculosis at Herman Klefer Hospital, and was on the visiting staff of Harper Hospital and the Detroit Tuberculosis Sanitarium, in addition to his private practice. He was a member of the Wayne County and Michigan State Medical So-

cieties, the American Medical Association, the National Tuberculosis Society, and was a former president of the Trudeau Society of Michigan.

He was married to Eleanor Gillet of Bay City, Michigan, who always interested herself warmly and sympathetically in his pursuits and pleasures.

His fine medical skill which was human and generous endeared him to a host of friends and patients. Sincerity, integrity, open-mindedness, kindness, and a keen sense of humor were Richard Morgan's outstanding qualities in private life as well as in the discharge of his professional duties and obligations. He will long be remembered for the charm of his sympathetic nature, by which he was pre-eminently successful in cheering, encouraging and comforting, not only his patients, but their families and friends as well. To have known Richard Morgan was to have loved him.

He was a true devotee of Nature, fully aware of the treasure of beauty in its bosom. Many expressions of his love for birds and flowers were witnessed in and around his home in the country. Until the last he did not lose the art of joy and humble life.

—DETROIT MEDICAL NEWS

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PNEUMOPERITONEUM, OXYPERITONEUM, AND NITROPERITONEUM IN THE TREATMENT OF PULMONARY AND ABDOMINAL TUBERCULOSIS

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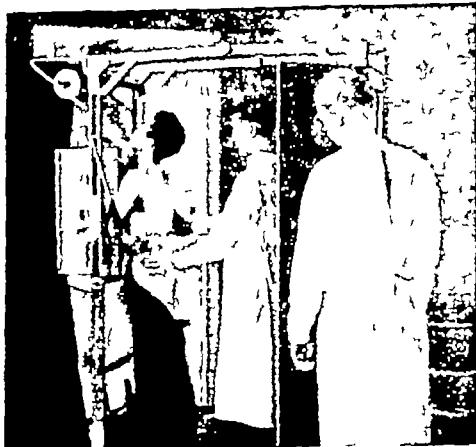
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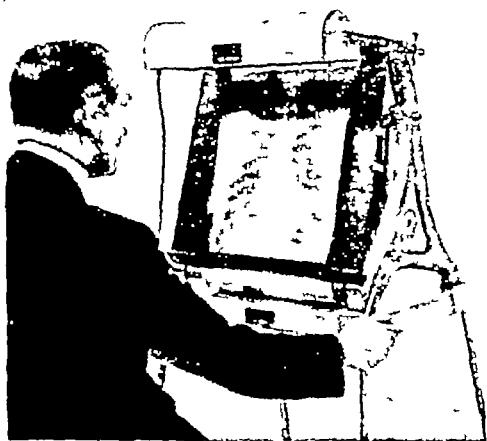


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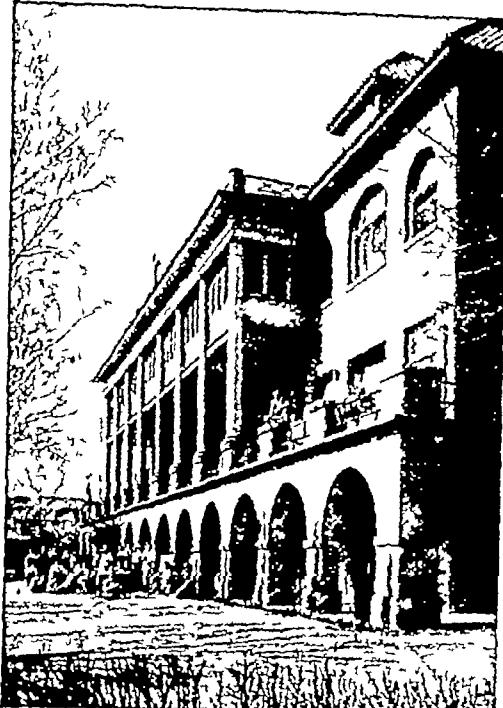
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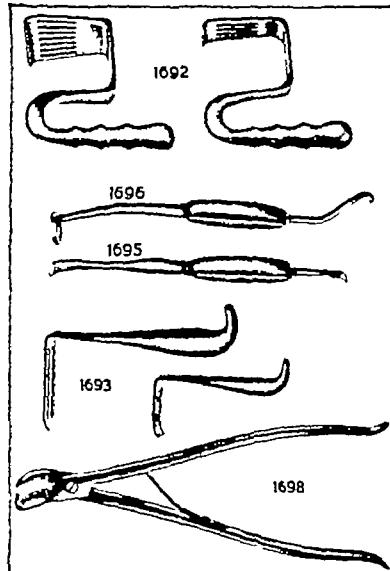
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NOVEMBER

1938

Sanatorium Digest

Volume I.

Number 11



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Official Organ of the Amer College of Chest Physicians
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MEMBER ASSOCIATED EDITORS OF TUBERCULOSIS PUBLICATIONS



(A MONTHLY PUBLICATION)

Subscription United States and
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countries \$2.50 per year
Entered as second-class matter
August 18 1936, at the post office
at El Paso Texas, under the Act
of August 24, 1912

Editorial Comment

PROGRESS OF THE PENNSYLVANIA PLAN

UNDER the aggressive leadership of Doctor Ralph Matson of Portland, Oregon, President Elect of the American College of Chest Physicians, and Chairman of the Committee for the Advancement of Tuberculosis Organization in Medicine, rapid strides are being made in the formation of tuberculosis committees in all state and county medical societies affiliated with the American Medical Association

It is hoped that the new committees as they are formed will be as potent in their respective localities as is necessary to bring case finding and case treatment up to the highest possible modern standard

If fearless and interested physicians are selected for the committee memberships, much will be accomplished along the desired lines. A few high points of endeavor are the following

1 Papers on tuberculosis, especially stressing case finding, early diagnosis, and modern treatment, should be presented in every season of medical society scientific meetings, state and county

2 A study of state and county tuberculosis sanatoriums, so that the committee members are fully cognizant of their needs and problems. Outstanding needs of the sanatorium

are outlined under "The Pennsylvania Plan"

3 Cooperation with other tuberculosis organizations, help them with the influence at your command, with constructive criticism. Quarreling and destructive criticism engender emotions that do not promote reform

Try to educate your communities to be dissatisfied with "Dummy Directors", wherever they find them. Recognized evils that receive sufficient attention and publicity, tend to correct themselves

F W. B.

PHYSICAL EXAMINATION

DURING recent years there has evolved a slogan in tuberculosis circles to this effect "Tuberculosis should be seen and not heard." While in some measure this saying expresses a truth and emphasizes the extreme importance of studying every case by means of the x-ray and fluoroscope, the physical examination should not be neglected, nor only a niggardly value ascribed to it. The physical examination, particularly that of the chest, is an integral part of the whole examination. In many instances it is indispensable and at times affords the only means of the diagnostic approach. It is wisdom, therefore, for the physician to appreciate the value and the more complete perspective that the physical examination lends, and to per-

fect himself as much as possible in its execution

To have had extensive experience and expert training in the larger clinics has not been the lot of most of us, to be endowed with that inherent ability some physicians possess is the heritage of only a few of us, but the observation of a few basic principles is to be had by all of us. It is to these the writer desires to call attention. They may be captioned under the headings *quiet, comfort and concentration*

It is absolutely essential that the examination of a chest be made in a quiet room. The noise of street traffic, the hum of an electric fan, the conversation of others in the room, the blowing of curtains, rattling of shades or the running of water—any of these may mean the difference between a satisfactory and unsatisfactory examination. Any doctor who specializes in or features chest work should have an inside examining room.

Comfort on both the part of the subject and the examiner is most conducive to a satisfactory examination and cramped, uncomfortable positions preclude it. For a brief quick orientation of the chest findings—such as in ward rounds in a sanatorium — the standing upright positions work very nicely. The patient slips off the bed, or out of his cure chair and stands in an erect, but relaxed manner beside it. The procedure of course is barred in very ill patients. In every chest examination, however, for the best results, a relaxed comfortable position for doctor and patient must be assured. In this connection, it may be emphasized that a sufficient exposure of the chest must be secured. No chest can be properly percussed or auscultated through the clothing. At times, in cases of timid, shy women, tact and patience is called for.

Lastly, but by no means of less importance, is the factor of concentration. A real chest examination cannot be made while the mind is wandering and dwelling upon matters far removed from the job at hand. Rales cannot be heard, nor differentiations in breath sounds made, while the examiner is thinking of his golf game. So—feel what you touch, hear what you listen to. In other words—

Concentrate!

C.H.H

"SURE CURES" ALL chronic diseases are the meat and bread of "sure cures" and quackery. Without such ailments as rheumatism, "liver trouble", Brights Disease, "prostatic trouble", "backache", chronic constipation, cancer, et al, the quack and the patent medicine man would have long since ceased to exist. Pulmonary tuberculosis is about the only specific disease that has always attracted quackery. By specific, we mean that it is a disease caused by a definitely known organism—the tubercle bacillus.

Since the beginning of time, almost, every type of "sure cure" has been advocated for this chronic disease. Sufferers were once told to live in the barn and breath the air and odors from the cow-lot in order to recover from tuberculosis! Some of the fads and fancies that have been advocated since that time were certainly not improvements on that idea and probably much more harmful—no matter how bad the cow-lot might have been.

To detail the vast number of "miraculous cures" that have been used is impossible. It is sufficient to say that nearly every drug or chemical known to man and many combinations that were unknown have been recommended at one time or another to be taken by mouth or by inhalation or by injection or simply by "rubbing on" to kill the tubercle bacillus.

Nor are we immune today. Hardly a day passes that some tuberculosis specialist is not approached by some one who has definitely "discovered" a sure cure for tuberculosis. And, unfortunately, he frequently has affidavits from one or more doctors telling of his miraculous results! What's to be done about it?

Again the problem falls into the lap of the family physician. He must not only be equipped to make an early diagnosis of the disease, but he must be able to advise the patient relative to his treatment. He should warn the patient about quackery in this disease and not spare the details. Above all, the medical profession should make certain that every patient receives the advantages of modern treatment for tuberculosis, because a neglected patient is easy prey for the "miraculous healer".

It is unfortunate that no specific has yet

been discovered for this disease, but until it is, it is the doctor's duty to protect the unfortunate sufferer from the quacks

R.B.H., Jr

**STOP,
LOOK,
AND LOOK!** It is common knowledge that a negative sputum — absence of tubercle bacilli — does not rule out pulmonary tuberculosis. Indeed, it is to be hoped that the diagnosis will not have to be made only when they are present. It also is common knowledge, and rightly so, that the presence of tubercle bacilli in the sputum means pulmonary tuberculosis. However, and this is the "raison d'être" for this editorial, there are circumstances under which tubercle bacilli are found in the sputum when the original, (dominant or perhaps best, primary) condition, is not tuberculosis. Because of this fact, the chest specialist has oftentimes been placed in a rather embarrassing position, and more important, the paramount pathological disturbance has been confused or not properly recognized. A latent tuberculous infection, such as commonly lies dormant within the lymph nodes in and about the hilus, may be stirred into activity with a release of its imprisoned bacilli, by another irritating and eroding disease process in the lungs. The most common offenders are suppurative disease and malignant growths. It is not very uncommon for a case of carcinoma of the lung to have tubercle bacilli in the sputum late in the evolution of the malignant process. Without the recognition of the facts above given, it would naturally be felt that the original diagnosis of carcinoma was an error, and the finder of the tubercle bacilli would throw out his chest in pride in refutation of the "specialist" who had made such a diagnosis. Perhaps, and not infrequently, the opportunity to employ curative surgery was missed and the mistake condoned.

Suppurative diseases of the lungs, usually present the problem in a different manner. They are usually recognized as such, but the resulting activation of an old tuberculous focus is not. This activation very often brings

on to the stage a progressive tuberculosis which is confused with the original lesion, and consequently the proper treatment for this resulting tuberculous condition is not applied. It has been the writer's experience that the advent of the tuberculosis comes with the subsidence—operative or otherwise—of the suppurative process. Tubercle bacilli are now appearing in the sputum. Has it been an overlooked tuberculosis all the time, is the question that now forms in the mind of the attending physician. Again, has the examination of the sputum for tubercle bacilli been abandoned, and the exacerbation in the lungs accredited to the original process? A proper evaluation of the facts would mean whether or not the correct therapy is inaugurated, and whether or not the patient is saved from an unnecessary premature death from tuberculosis. Perhaps the moral of this editorial is

Stop, Look and Look!

C.H.H.

POL N CORYLLOS WITH the passing of Dr Pol N Coryllos of New York City, one of the most capable and versatile thoracic surgeons has departed from our midst. He will be missed at the medical meetings, where his presence, interesting papers and discussions were always in demand.

Dr Coryllos was a Fellow of the American College of Chest Physicians as well as a member of numerous other medical societies. He was a prolific writer and his writings will live long after Pol Coryllos, the man, is forgotten. We join, with his many friends, in a salute to Pol Coryllos, surgeon, author, and good fellow.

C.M.H.

ERRATUM

Through an error, the initials of Dr Orville E Egbert, who contributed the editorial for the September issue of the journal, entitled, "Allergy in Tuberculosis" was omitted. It is the custom of the Editorial Board of *Diseases of the Chest* to initial all editorials so that our readers may refer to the authors when desired.

The Evolution of the Treatment of Pulmonary Tuberculosis*

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TREATMENT of pulmonary tuberculosis has run the gamut of methods from the most distant times. The ancients, with their faulty theories of disease and their wholly empirical *materia medica*, advised the most extraordinary and often the most disgusting combinations for curing phthisis. In pre-Hippocratic days, medicine was intimately associated with religion and the Father of Medicine himself only partly succeeded in disentangling the two. In the Middle Ages Patron Saints for special diseases prevailed, just as special Deities had in Egyptian times. Pliny the Elder, who perished at Pompeii in the eruption of Vesuvius, A.D. 79, gives the following as his "cure" for pulmonary tuberculosis:

"The cure for phthisis is effected by taking a wolf's liver boiled in thin wine, the bacon of a sow which has been fed upon herbs, or the flesh of a she-ass, eaten with the broth, the last mode in particular being the one that is employed by the people of Achaia. Smoke of dried cow-dung inhaled through a reed is remarkably good for phthisis."

Unquestionably scrofula was very prevalent in ancient times, if one can judge from the numerous prescriptions for its cure. Among the remedies mentioned may be cited eating "the middle of a snake", "to dig up a cricket with the earth of its hole and make a liniment", or "a mole's right foot was also a good remedy". To our modern minds, these rather pathetic prescriptions appear as the "whole time high" of empiricism and one wonders at their origin.

The Chinese also had extraordinary prescriptions for consumption. For example "The testicles of the dog, the lungs of the hog, and the flesh of the crow were recommended and furthermore, 'to know if the remedy is good, one chews a little, runs for an hour, and if

one does not then vomit, the remedy is good'."

Hippocrates and Galen used phlebotomy for hemoptysis (perhaps not a bad idea and more or less analogous to the use of large doses of atropine (gr 1/33 to 1/25 hypodermically) and also for beginning phthisis, though probably their ideas of a truly minimal case would differ vastly from ours). Thomas Dover, the originator of Dover's powder, which all of us use occasionally, advised, in cases of consumption, taking "six ounces of blood every day for a fortnight if he lived so long and then every other day, then every third day, then every fifth day for the same time". Were this practiced in 1937, what a bonanza for the professional donors and the transfusion specialists!

Louis, whose "Recherches sur la Phthisie" constitutes one of the classics of all time, strongly recommends the use of opium, probably confounding the subsidence of cough by the use of this drug with definite improvement in the diseased area. Needless to say, opium in some form is still abundantly used in the treatment of tuberculosis, but only as a palliative.

With our modern ideas of rest as the cornerstone upon which must be based the treatment of all tuberculosis, whether medical or surgical, it is interesting to note how often this element was mentioned by ancient, mediaeval and modern writers before receiving its accolade at the hands of contemporaneous authors.

Galen, who was sceptical regarding the cure of consumption, gathered from a suggestion of Hippocrates in regard to horizontal rest for leg ulcers, that ulceration of the lungs demanded rest in order to heal. Galen realized that the lungs were always in motion, and also that the cough aggravated the disease. Celsus counseled patients with hemoptyses to take to their beds and remain in absolute silence.

Perhaps Morgagni (1761) should be credited with the first attempted application of the

* Read by invitation before the Fifth District Medical Society of Georgia, at its meeting in Atlanta on October 7, 1937

principle of rest He ordered a patient with pulmonary and laryngeal tuberculosis "to stay in a room at even temperature, to be free from all care, to listen to his friends rather than to talk to them, and if speech was necessary to confine it to 'a most gentle whisper' The patient recovered" This is very much in line with our present advice, save where we feel that the laryngeal lesion is suitable for treatment with the electro-cautery

Jean Pierre David (1779), a surgeon, gave the first concrete illustration of the value of rest in the treatment of tuberculosis in his essay "Les Effets du Mouvement et du Repos dans les Maladies Chirurgicales" In his preliminary discussion he says "When Nature, to save an individual, sacrifices movement of a part or of its shape, art should frequently consist in not disputing but in being a spectator", and again, "The history of our errors is often more instructive to others than the story of our successes"

Armond Trouseau, in 1737, wrote a masterly article on laryngeal tuberculosis in which he advocated silence and "writing on a slate" His sage counsel was unobserved for many years and the idea was not again suggested until the twentieth century, when Sir St Clair Thompson, a British laryngologist who was himself a sufferer from tuberculous laryngitis, emphasized the desirability of "writing on a scratch pad"

John Hilton (1804-1876), whose classic, "Rest and Pain" either has been read or will be read by every person in this audience, was, in 1857, probably the first to record the benefit of bed-rest in pulmonary tuberculosis A patient came to him suffering from a tuberculous hip, which he promptly splinted Against his better judgment and because of the importunings of the family, he removed the hip splint after six months, only to have the disease become reactivated Having recognized that in addition the patient had bilateral apical pulmonary disease, he was astounded to find at the end of a half year's bed-rest to what an extent the pulmonary pathology had receded He was also among the first to show that bed-rest was beneficial, rather than harmful, to the general health and to-day we still have to argue this question with patients and particularly with their families! It is obvious from the foregoing that

rest in tuberculosis was instigated primarily by surgeons dealing essentially with what we now consider cases of "surgical tuberculosis"

We now leave what we may call "ancient rest" and proceed to other considerations in the evolution of the treatment of tuberculosis before returning to "modern rest"

Down through the ages, in the treatment of tuberculosis, climate has been a "leit motif" Susenta in the "Yejurveda" (Science of the Length of Life) advises that "the consumptive should go and live in elevated regions" Galen sent his patients to Tabia, near Vesuvius, a mountain resort frequented by tuberculous patients for hundreds of years It was early believed that emesis was good for the tuberculous, probably because sputum was more copiously evacuated when nausea was present and, therefore, sea voyages were advised As many could not comply with the advice given because of financial restrictions, various infamous methods were suggested for producing nausea far from the broad ocean Swinging was one of them which had an ephemeral vogue, but Erasmus Darwin, the grandfather of Charles Darwin, suggested that "instead of swinging, nausea could be conveniently provided by rotatory motion in a chair, suspended by a rope, and turned thirty times around several times a day for an hour or two!"

Up to approximately thirty years ago, climate was looked upon as being a sovereign element in the treatment of tuberculosis Saranac Lake, Asheville, Colorado, the Southwest and California, to say nothing of Switzerland, the Black Forest and Egypt, were supposed to possess some sacrosanct qualities which exercised a special influence upon the ravages of the tubercle bacillus During the past fifteen years the pendulum has swung to the other extreme, and by many, climate is now decried as having absolutely no influence upon the course of the disease Both extremes are wrong The unlimited faith in climate that ushered in the twentieth century is a dream from which the dreamers have awakened The condemnation of climate as an element which has no influence in the treatment of tuberculosis is a fetish to which too many cling at the present moment The aphorism, "What you do is far more important than where you do it" is absolutely true

I would much prefer to have a patient live *right* in Boston or New Orleans than live *wrong* in Asheville or Saranac or Tucson, but, all other things being equal, proper life in a particularly salubrious climate is an advantage and none can know it better than those of us who happen to live and practice in such a locality. Of course, we cannot yell this from the housetops, for we would lay ourselves open to the accusation that we were crying for our bread and butter. None the less, it is the truth and, were it practicable, numberless witnesses for the defense could be called upon to testify.

A change has also come over the evaluation of the importance of fresh air in treatment. A hundred years ago the tuberculous patient was deprived of all possible air and light and was almost suffocated. From the latter part of the nineteenth century the pendulum swung to the other extreme, so that when I took the cure in 1905 and for many years thereafter, the patient was made to feel that every hour he was out of doors he was getting better and every hour he was indoors he was getting worse. Weak, debilitated individuals were forced to remain on porches in sub-zero weather, so weighted down with clothing and blankets as to be well-nigh crushed. The sleeping-porch was considered an absolute essential. Now we know that all that is needed is fresh, freely circulating air, that artificial heat is not taboo and that comfort is infinitely preferable to hardship. Some of our long passed colleagues saw the light. George Bodington (1799-1882) wrote "To live in and breathe freely, the open air is one important and essential remedy in arresting the progress of tuberculosis", and a far-seeing physician, W. Black, had written in 1781 "Seeing that such multitudes die of consumption in London, and knowing that pure air is at least equal to diet or medicines in this direful distemper, would not two or three hospitals built for consumptive patients, at a few miles distant from London, save hundreds of lives annually?" Oddly enough, such outstanding figures as Bayle, Laennec and Louis paid no attention to fresh air. This is all the more astounding in view of the fact that Laennec was a sufferer from the disease, and finally died of it.

Sanatorium treatment of the disease is the best, both from the standpoint of chances for recovery for the patient and from that of lessening contacts and consequent spreading of infection. I have enlarged upon this in a paper written in 1931, entitled "Home Treatment versus Sanatorium Treatment in Pulmonary Tuberculosis," but time will not permit dwelling upon that particular topic at present. It seems strange that with hospitals flourishing for so many centuries the tuberculosis hospital or sanatorium is so comparatively new. Brehmer established the first sanatorium at Gorbersdorf in 1859, and his pupil Dettweiler, the second, at Falkenstein in 1870. To be sure, the Brompton Hospital for Consumptives had been started in England in 1848, "but open air treatment was not in vogue, and about all patients seemed to do was to avoid draughts and take cod liver oil." Trudeau, in 1884, founded the Adirondack Cottage Sanatorium at Saranac Lake—the first in this country—in which the importance of fresh air and of rest were emphasized. Based upon it as a model in principle, there are to-day in the United States about 600 sanatoria with a capacity of over 80,000 beds. Verily, when the sanatorium in this nation did begin to increase and multiply, it did so with giant strides!

One of the most remarkable chapters in the evolution of the treatment of tuberculosis is the rise, brilliant reign and complete collapse of tuberculin as a therapeutic agent. When Koch, in 1892, announced the discovery of old tuberculin, it was felt that a cure for tuberculosis had been achieved. At first large doses were employed and severe reactions desired (and secured!). There is no doubt that many people were killed by over-dosage. Soon objection to this method of administration arose and it was thought that good results were obtained by giving truly homeopathic doses—a millionth of a milligram, and slowly increasing. The medical world went tuberculin-wild! The remedy was at the height of its popularity from about 1908 to 1913. Any number of tuberculins were on the market, manufactured in all manner of ways. At one time the list numbered over seventy, but the most popular were Old Tuberculin, Bacillus Emulsion (which was really a vaccine of tubercle bacilli), Deny's Tuberculin, and, es-

All workers in tuberculosis are agreed that

pecially in this country, von Ruck's Watery Extract Everybody gave tuberculin to almost every patient The pharmaceutical houses sensed the need for participation, and accordingly serial dilutions were prepared and sold to physicians, many of whom knew nothing of the working of tuberculin, its mode of action, or the indications for its use, but who had simply jumped on the band wagon and were blissfully giving their patients 3 drops of Solution 4, or 8 drops of Solution 7, as the case might be The literature on tuberculin was enormous and contributed to by the best minds in the country After 1913 its popularity waned rapidly The reason? It is difficult to say Perhaps because faulty use made people afraid of it, perhaps because with the lapse of years results were not as good as it had been fancied they would be, perhaps because of the advent of stricter bed-rest with its excellent results, and perhaps, too, because of the dawning adolescence of that greatest of all boons to the tuberculous, collapse therapy In any event, tuberculin is "gone with the wind" in pulmonary cases, though still used very charily in surgical tuberculosis

For the past sixty years or so there always has seemed to be a "treatment" for tuberculosis Beginning with the advice given in the 70s and 80s, "go West, young man, and rough it," down through the era when climate was everything, through the tuberculin period, we have finally come to the phase which may be called "modern rest" The period of modern rest may be said to begin at the close of the tuberculin craze, or about 1914 It started with physical rest, bed-rest, in the most pronounced examples the patient not being allowed to move, use of the bed-pan insisted upon, self-feeding prohibited Not many physicians were such extremists, for the effect upon the patient's morale was very bad and he inevitably felt that he was, indeed, sick unto death In the majority of instances months and months of bed-rest were prescribed, the patient being allowed to use a commode and to feed himself Bed baths were prescribed and all physical effort was forbidden This intensive bed-rest did wonders for many, but artificial pneumothorax was becoming more and more known and thus there occurred a transition from physical rest

alone to physical rest plus physiological rest, which could be obtained if the lung could be placed in an air splint and therefore immobilized It was further found that the addition of physiological rest was a great shortcut and reduced the time and tedium of bed-rest Pneumothorax became more and more common Given at first in practically unilateral cases because of the fear of added respiratory strain upon the so-called "good lung," it soon became evident that compression of one lung and elimination of poison absorption would have a salutary effect upon the contralateral lung, and the scope of pneumothorax treatment was correspondingly widened

James Carson, of Liverpool, in 1821, first suggested the employment of artificial pneumothorax He stated that by this procedure "the diseased part would be placed in a quiescent state, receiving little or no disturbance from the movements of respiration, which would be performed solely by the other lung, and the divided surfaces would be brought into close contact by the same resilient power which before had kept them asunder "

Carson's advice went unheeded and it remained for Forlanini, of the University of Pavia, in 1882, to propose anew artificial pneumothorax, the idea having come to him from observing the beneficial influence upon largely unilateral pulmonary tuberculosis of the development of a pleural effusion, or of a spontaneous pneumothorax did the patient survive the initial shock He succeeded in persuading the medical profession in 1892 that his claims were valid and thenceforth the procedure was put into practice in Europe I believe that Dr Mary Lapham, of Highlands, North Carolina, was one of the first physicians in this country to use the new method, for I heard her read a paper on the subject at Greensboro in 1908 and I know that I listened to it through the ears of a "doubting Thomas," little realizing that three years later I would be giving my first injections Dr John B Murphy, of Chicago, with no knowledge of preceding work, attempted artificial pneumothorax in 1898, but believed in compressing the entire lung at one sitting and secured such severe reactions that, feeling the remedy to be worse than the disease, he abandoned the procedure

Even before collapse therapy by means of pneumothorax had been seen to be of value, certain surgeons, desiring to secure rest for the damaged lung, had sought rib resection, with its resulting pulmonary collapse, as a solution. The credit for the first partial thoracoplasty (three ribs resected, the second, third and fourth) must go to de Cérenville, of Lausanne, who performed the operation as early as 1885, but the first complete thoracoplasty (exclusive of the first rib) was not done until 1907, when it was performed by Friedrich Ferdinand Sauerbruch, of Munich, did his first complete thoracoplasty (first rib included) in 1909. Physicians in Europe, and far more so in this country, were slow to fancy the new approach to the cure of tuberculosis through surgery, and it is true that the early procedures were very radical, tremendously shocking and exceedingly painful.

Partial pneumothoraces with unclosed cavities could be dealt with only by abandoning the pneumothorax and resorting to thoracoplasty with all its horrors, until in 1913 Jacobaeus, of Sweden, devised the procedure of internal pneumolysis whereby, in suitable cases, an incomplete pneumothorax might be rendered complete by cauterizing, and thereby severing, the offending adhesions. This operation has been very popular and exceedingly successful. Ralph Matson, of Portland, Oregon, deserves mention here as being the pioneer in this country to popularize and improve this operation. In the past three years I have had twenty-eight patients operated on by Dr. Julian Moore, of Asheville, with most gratifying results in the vast majority of cases.

Phrenicectomy was first done by Sauerbruch in 1911. Stuertz had previously proposed it, but Sauerbruch did it knowing nothing of Stuertz's publication. The operation now done most frequently is phrenic crushing, together with cutting the accessory branches, which paralyzes the corresponding dome of the diaphragm for eight or nine months. If it is desired to make the temporary paralysis permanent, it is a very simple matter to do so. The phrenic operation is rarely of great value *per se*, but as an adjunct to pneumothorax or as a preliminary to thoracoplasty, and occasionally as a palliative to relieve distressing symptoms, it oc-

cupies a definite place in the surgery of tuberculosis.

To-day the tendency of treatment is all toward collapse in some form and by some means. Collapse therapy is the greatest advance made in the treatment of tuberculosis since the introduction of physical rest, and is the only method offering a good chance of recovery to the far advanced case. Thoracic surgery is making great strides and the men most prominent in this branch of the surgical art are individuals that know a great deal about the medical aspect of tuberculosis, which is well, for in thoracic surgery intimate team-work is necessary between physician and surgeon, and the more the one knows about the other's domain the better. With enthusiasm for collapse running high, I feel that perhaps the pendulum has swung too far to the right. There are men advocating collapse, in every minimal case, as soon as the diagnosis is made. With this view I cannot sympathize. There are certain dangers in any form of collapse therapy. There are many early cases of tuberculosis that will heal under bed-rest. I believe that if the lesion is slight and not destructive, do not collapse, if the lesion is slight but progressive, collapse.

In many large cities doctors are conducting ambulant pneumothorax clinics, collapsing the lung and hospitalizing the patient for a few days, then letting him go home and return to his work if possible. This is not, by any means, an ideal scheme, but, I realize full well, is a necessity in thickly populated districts where hospital beds are lacking and where the economic status of the patient is such as to render return to work at the earliest possible moment imperative. Another makeshift that is being employed both in this state (I believe) and, I know, in North Carolina, to which I cannot give my unqualified approval, is that of having rural physicians go to the State Sanatorium, witness and give pneumothorax refills, purchase the necessary apparatus, and then, when their pneumothorax patients leave the sanatorium and return home, continue the refills. This procedure, again, is due to insufficient sanatorium beds and to the necessity of a more rapid turnover in the state institution, but it is rather deplorable because there is far more

to the administration of pneumothorax than the simple technique of inserting a needle between the ribs into the pleural cavity and then injecting air. Considerable judgment is required in conducting a pneumothorax case, judgment which obviously the individual who has but two or three cases to treat cannot be expected to fully exercise. Nevertheless, these procedures probably result in the greatest good to the greatest number and something must be done to eliminate the enormous waiting lists of various state sanatoria, for, because of the length of time that must elapse from application to admission, the chance of recovery that the patient may have had is often greatly lessened.

I feel that there is danger in the evolution of the treatment of tuberculosis toward making it a surgical disease. I have not the least objection to its being classed as a surgical disease if that is where it belongs, but I cannot think of any disease that, taken by and large, strikes me as more *medical* than does pulmonary tuberculosis. It is essentially a medical disease that, in many properly selected cases, can be enormously aided, and often cured, by surgery, but fundamentally it belongs to the realm of medicine and it always will.

It would seem, then, that the treatment of tuberculosis has changed vastly with the march of time, and that the element of rest has come to be the cornerstone upon which the edifice of modern therapy is erected. rest, both physical for the entire individual and physiological for the diseased organ. Will something else supersede rest? I do not think that anything will ever supersede it, though we may find new adjuvants. As has been brought forth, attempts to fight tuberculosis with biological products (the tuberculins) were not successful. In the past few years attempts have been made to combat the disease along chemical lines, the product receiving the most attention being Gold-Sodium-Thyosulphate, sold under the trade-

name of Sanocrysin. Up to the present the results obtained abroad have not been sufficiently conclusive to warrant placing any great faith in the remedy. It has been used but scantily in this country.

B C G (Bacillus Calmette-Guerin), a vaccine of living but attenuated bovine tubercle bacilli, for vaccinating infants against tuberculosis, has been in existence too short a time to enable conclusions to be drawn as to its value. We must wait until the vaccinated infants grow up and then compare the morbidity of tuberculosis in those vaccinated with that in the non-vaccinated.

Collapse therapy in its various forms has proved a great short-cut, as well as a life-saver, in the treatment of tuberculosis, but the fact remains that a considerable length of time is necessary for recovery from the disease and the patient who gets well under a couple of years is lucky beyond the average.

We do not know what the future will bring forth — perhaps an immunizing hypodermic, perhaps a curative serum or vaccine or metal, who knows? Our treatment now represents the latest, but by no means the ultimate link in the therapeutic chain begun centuries ago. When we think back upon what has been done in the treatment of tuberculosis in the past seventy-five years and when we see the advances that have been made, we should look confidently to the future and feel that somewhere, somehow, sometime (and that not too far away) will be found the ideal treatment, and that with its discovery will come the triumphant culmination of all the efforts that have been made throughout the ages to control the ravages of the tubercle bacillus.

N.B. In the preparation of this paper I have been greatly aided by data obtained from *Tuberculosis*, by Dr. Gerald B. Webb, appearing as one of the Series of "Clio Medica" published by Paul B. Hoeber of New York, and also by *The Surgery of Pulmonary Tuberculosis*, by Dr. John Alexander, published by Lea & Febiger, of Philadelphia.

"The most important factor in diagnosis in the majority of cases of pulmonary tuberculosis is keeping the disease in mind."

Lawrason Brown, M.D.

Pneumoperitoneum, Oxyperitoneum, and Nitroperitoneum in the Treatment of Pulmonary and Abdominal Tuberculosis*

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PNEUMOPERITONEUM is the injection of air or other gas into the peritoneal cavity, or the presence of gas in the peritoneal cavity, oxyperitoneum is pneumoperitoneum in which oxygen is the inflating gas, nitroperitoneum is pneumoperitoneum in which nitrogen is the inflating gas, when speaking of pneumoperitoneum artificially produced, we mean air unless otherwise specified

Historical

Bainbridge¹, in January, 1908, spoke before the Medical Society of the State of New York on Oxygen in Surgery He mentioned that Doctor Gothmay tried, but was unable to kill an animal by over-distension In 1909², he reported seventeen cases of tuberculous enteritis with ulceration, and tuberculous peritonitis, cured by oxyperitoneum treatment

Dr John A McGinn of Philadelphia², in June, 1908, reported before the Philadelphia Obstetrical Society, the successful treatment of tuberculous peritonitis by inflating the peritoneal cavity with oxygen

Meeker⁴, in 1912 inflated the abdomen with oxygen after laparotomy in a case of tuberculous peritonitis with ascites, which showed immediate improvement and rapid cure

Goodwin⁵, in 1912, reported encouraging results with the same procedure after four years' experience

Rost⁶, in 1920, treated by inflation with oxygen, four cases of psoas abscess, three cases of tuberculosis of the knee, and one of tuberculous peritonitis In describing the peritonitis case, which was exudative, he said, "It was an advanced case with a certain amount of matting of the intestine and large masses of tuberculous material in the me-

sentary The patient was very emaciated, was running a hectic temperature, and suffered a great deal of pain and discomfort He was operated on by me before I had hit upon the oxygen method, and his abdominal cavity had been well irrigated with saline fourteen days previous to using the inflation method" In this case the abdomen was inflated with oxygen until tympanitic as a drum Two hours later discomfort ceased, and the temperature dropped to normal that night and remained so The man received two subsequent inflations, became well, and remained well

Weil and Loileseur⁷, in 1921, reported their experience with air injections into the peritoneal cavity of six cases of tuberculous peritonitis with ascites, after removal of the fluid In spite of the fact that they gave only from one to five treatments, they reported fifty per cent of cures

Fritz⁸, in 1921, using air, Stein⁹, in 1922, using oxygen, Mattick¹⁰, in 1924, using oxygen, Gilbert¹¹, in 1924, using air, and E W Hayes¹², in 1924, using oxygen, reported excellent results in tuberculous peritonitis, with and without exudate, and in tuberculous enteritis

Banya¹³, in 1931, reported using pneumoperitoneum in treatment of tuberculous enterocolitis, and in 1934¹⁴, first reported pneumoperitoneum in treatment of pulmonary tuberculosis, with a subsequent report in 1937¹⁵

Trimble and Waldrip¹⁶, reported a series of cases of pneumoperitoneum treated for the pulmonary effect of raising the diaphragm

Dr A Worth Hobby¹⁷, of Atlanta, Georgia, has used pneumoperitoneum in treatment of nineteen cases of pulmonary tuberculosis He states regarding pneumoperitoneum " its usefulness in selected cases has been proved in the short time it has been utilized"

* Read at the Philadelphia County Medical Society, April 20, 1938

**Chief of Pulmonary Diseases, St Luke's and Children's Hospital, Philadelphia, Pa

Choice of Gas

Oxygen is used by me for the initial induction of pneumoperitoneum and for the first few refills, in every case. The reason is the rapid absorption of oxygen by the tissues should any gas fail to be placed or retained in the peritoneal cavity. Oxygen seems to be more therapeutically effective in treatment of tuberculous enterocolitis and tuberculous peritonitis. The chief objection to its continued use over a long period of time is the rapidity with which it is absorbed from the peritoneal cavity, refills must be given twice weekly.

Nitrogen is used in refills as soon as there is freedom from adhesions and a free space in the peritoneal cavity in which to insert the needle. It is used in those cases which do not need the local effect of the oxygen in the peritoneal cavity, but where the sole need is elevation of the diaphragm. Nitrogen refills need be given only at two week intervals.

Air can be used in place of oxygen. It does not seem as active therapeutically, but remains longer in the peritoneal cavity, so that refills need be given only weekly.

Technic

Patient lies on back, abdomen and lower chest exposed. Skin in operative area is sterilized with Untinted Tincture of Metaphen or Untinted Tincture Mercressin. A point just below the rib margin in the left nipple line is selected.

With strictly aseptic technic, the skin and subcutaneous tissue is anesthetized with an injection of 2 cc of $\frac{1}{2}$ per cent sterile Novocain solution, using a 27 gauge needle. Then a $2\frac{1}{4}$ inch, 19 gauge rustless steel needle attached to a 5 cc syringe of $\frac{1}{2}$ per cent sterile Novocain solution and to the gas line from the pneumothorax apparatus by means of a three-way stopcock, is inserted into the anesthetized spot, slowly advancing the needle, and endeavoring to anesthetize ahead of the point by frequent small injections of novocain from the attached syringe. This proceeds down to and through the peritoneum, which can be identified when encountered by the needle point by the experienced pneumothorax operator. The valve of the stopcock is then turned, disconnecting the syringe and

connecting the needle with the gas line from the pneumothorax apparatus, and oxygen is allowed to flow.

The amount of gas injected depends upon the pressure caused by the introduction of the gas, which is measured on the manometer tube of the apparatus, and also upon the feeling of fullness of the patient. Pressure should not go above plus four centimeters of water at the first injection, with increase of one centimeter of water at succeeding refills up to 10 or 12.

The procedure should be entirely painless, but there should be slight discomfort between the shoulders immediately after the initial and first few refills, due to raising of the diaphragm. No dressing should be applied after withdrawal of the needle.

Physical Results of Pneumoperitoneum

- 1 Diaphragmatic elevation, bilateral
- 2 Separation of liver, stomach, and spleen, from the diaphragm
- 3 Separation of all but very strong adhesions in the abdomen
- 4 Diminution in size of the thoracic cage, favoring selective collapse of diseased lung tissue

Indications for Pneumoperitoneum

- 1 Tuberculous peritonitis with or without fluid
- 2 Tuberculous enterocolitis
- 3 Tuberculosis of the mesentery
- 4 Persistent vomiting in tuberculous patient (adhesions or after left phrenic operation)
- 5 Tuberculosis of the lungs in any case where pneumothorax is indicated, but impossible or ineffective on account of irremovable pleural adhesions
- 6 Advanced cases of bilateral pulmonary tuberculosis in which all functioning lung is needed. Unlike pneumothorax, I have never seen pneumoperitoneum increase dyspnea.

Advantages of Pneumoperitoneum Over Phrenic Crush or Exeresis

While pneumoperitoneum raises the diaphragm, it frees it from the dead weight of the liver, thus increasing the expulsive motility of the diaphragm under cough. Patients with great regularity note the increased ease

and diminished effort with which they can raise sputum and clear their bronchial passages There is also the advantage of rise of both sides of the diaphragm

Gastric symptoms are alleviated by pneumoperitoneum, whereas after left sided phrenic interruption, the gastric difficulties are often severe and persistent, to such an extent as to interfere with nourishment of the patient, so necessary in tuberculosis

Pneumoperitoneum can be abandoned at will, phrenic interruption persists for at least six months

While the immediate results of phrenic interruption are sometimes brilliant, too often the lower lobe becomes a cesspool of stagnant secretions, which cannot be removed due to the phrenic palsy interfering with cough, following, we have pulmonary interstitial fibrosis and bronchiectasis And, if the patient hemorrhages after a phrenic operation, there is danger of drowning in the blood, or at least a septic pneumonia The late results of phrenic interruption are so discouraging that there has been very general abandonment of the procedure except in special cases

Illustrative Cases

C J S, white, male, 28 years In 1929 he developed pulmonary tuberculosis with a small cavity in left upper lobe He was kept in bed at home three months The cavity was said to have closed at that time and he made an apparently good recovery I did not see him during that illness Whereas, he had been previously constipated, from the time of that attack he invariably had liquid stools, two to three a day

He was first seen by me December 27, 1935, six years later, referred by Dr George Lorenz, because of repeated pulmonary hemorrhages from the left upper lobe, in which there was definite signs of activity with two cavities, confirmed by x-ray and positive sputum The left lung was promptly collapsed by artificial pneumothorax with loss of sputum, gain in weight and apparent health, with the exception of the liquid stools, which continued unchanged

In March, 1937, fifteen months after the start of his pneumothorax and while it was still being continued, he began to get insidiously increasing discomfort in the region of

his ascending colon, with low grade fever and loss of weight He was hospitalized and continued to become worse until June 10th, when Oxyperitoneum was started The fever gradually subsided, pain ceased, weight increased He was discharged from the hospital June 22nd, only twelve days after his initial oxyperitoneum His refills were changed to nitrogen, which he has been receiving at two week intervals since The stools gradually lost their liquid character until now they are similar to their condition prior to his first active attack in 1929

In this case, we accomplished in twelve days vastly more than was achieved by three months absolute bed rest with high caloric, high vitamin diet

* * * * *

L M B, white, female, was 32 years old when diagnosed as pulmonary tuberculosis Usual symptoms, including several hemorrhages, dated back one year prior to diagnosis The first positive sputum of which I have record, was in February, 1936 I first saw her in March, 1936, although she had been in Hamburg, Pennsylvania, State Sanatorium in 1931, and Mount Alto State Sanatorium in 1936 In July, 1936, pneumothorax of right lung was instituted because of repeated large hemorrhages Abdominal distress and frequent vomiting were present throughout the time of her observation, and in spite of the pneumothorax became so much worse that by March, 1938, she was confined to her bed, the pain became very severe, and the vomiting occurred with every ingestion of food or liquid

Oxyperitoneum was induced March 24, 1938, and the vomiting ceased in the first two days The abdominal symptoms are relieved, and she is now gaining weight She has not hemorrhaged since, though she did frequently before, in spite of her pneumothorax

* * * * *

M R, white, female, age 36 History of chronic fibroid tuberculosis of twenty years' duration Chronic laryngeal tuberculosis with recurring acute exacerbation and constant hoarseness She was first seen by me March 14, 1937 At that time, she had extensive infection of the left lung with persistent rales throughout, moderate to slight involvement of right lung Pneumothorax was tried, but

air could be induced, even under positive pressure, into the base only, where it was completely ineffectual Sanatorium care, followed by months of absolute rest in a mountain hotel, failed to diminish the activity in the left lung Oxyperitoneum was instituted on September 27, 1937, with great difficulty due to the great amount of peritoneal adhesions It is still being continued The signs of activity have disappeared, x-ray reveals improvement in both lungs, and the patient is gaining in a feeling of well being, weight, and strength

J F (Fig No 1), white, male, 26 years, was first seen and given oxyperitoneum by me January 11, 1938, after three months in Philadelphia General Hospital and fifteen months in Hamburg State Sanatorium A large cavity in the right upper lobe, while he was in the Philadelphia General Hospital, continued to increase in size in spite of rest treatment Thoracoplasty was advised Pneumothorax was attempted in Philadelphia General Hospital and Hamburg, but could not be done because of pleural adhesions (Fig No 2) Three months' treatment by pneumoperitoneum have diminished the size of his cavity, the amount of his sputum, and the number of tuberculous bacilli in the sputum (Fig No 3)

R B, white, female, 31 years, had chronic pulmonary tuberculosis and tuberculous peritonitis, duration 1½ years She was admitted to my service in St Luke's and Children's Hospital, December 28, 1937, with history of discharge from State Sanatorium after four months' treatment, the last three of which were spent in bed Vomiting was constant during those months Oxyperitoneum was induced the day of admission Vomiting immediately stopped Patient has regained lost weight and wants to go to work She is symptom free Her stay in the hospital was four days Her pneumoperitoneum is being maintained by weekly injections of air

N S, white, female, age 36 years, had minimal pulmonary tuberculosis, inactive Ten years of abdominal pain, secondary anemia, low grade fever, loss of weight Blood recovered, weight regained and abdominal

symptoms ceased promptly with oxyperitoneum treatment Patient had been diagnosed as neurasthenic after thorough study in two of our foremost hospitals

A M, white, male, 52 years, had bilateral, advanced pulmonary tuberculosis, chronic and active Pneumoperitoneum was begun November 16, 1937 Dyspnea is diminished, general health is improved, and he has returned to his work, which is sedentary X-ray shows considerable clearing of his lung fields

I H, white, female, 34 years, had tubular bronchiectasis of the left lower bronchial tree This case is not of proven tuberculous origin Pneumoperitoneum is being tried along with lipiodol therapy to see if freeing of the diaphragm will assist in clearing the bronchi of the retained secretions Treatment was started three weeks ago, too recent to form any opinion

Conclusions

Pneumoperitoneum is a safe procedure in the hands of the trained pneumothorax operator It is painless, and leaves no scar

It is far superior in every way to phrenic exeresis or crush

It should be employed in all cases of tuberculosis of the mesentery, peritoneum, and intestine

Pneumoperitoneum should be used, in addition to pneumothorax, in those tuberculous cases having vomiting attacks, extreme repugnance to food, or unexplained chronic abdominal pain

Pneumoperitoneum should be employed in all cases where pneumothorax is indicated, but impossible or ineffectual, due to adhesions, before more dangerous procedures, such as thoracoplasty, are resorted to

Pneumoperitoneum should be used in those cases of pulmonary tuberculosis with involvement so extensive that dyspnea is present, making pneumothorax inadvisable

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DISEASES OF THE CHEST

OCTOBER

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CASE J F

Fig. No 1 4-3-36 at the time patient was diagnosed

CASE J F

Fig. No 2 12-30-37 X ray following continuous bed rest since 4-3-36

CASE J F

Fig. No 3 4-14-38 X ray after three months Pneumoperitoneum treatment Note the high position of the right diaphragm

NOTICE

The International Physicians' Luncheon Club of New York extends a most cordial invitation to physicians visiting New York to be honored guests at an excellent international luncheon, at the same time offering the services of the Members of the Club for any information they may desire.

While guests are not requested to make speeches, any useful information they wish to give informally will be greatly appreciated as fostering medical progress and international

goodwill among physicians from all over the world.

Luncheon is served at the International Medical Center, 135 East 55th Street, New York, Every Tuesday punctually at 1 o'clock and is over about 2 o'clock. Physicians are kindly requested to inform the Club of their presence not later than 9 A.M. Tuesday by telephoning Wickersham 2-7900, or writing International Physicians' Luncheon Club, 135 East 55th Street, New York.

**FOR HIS BIRTHDAY
SUGGEST
A PHYSICAL EXAMINATION**

Present-Day Management of Lung Abscess

Report of Two Illustrative Cases

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ABSCCESS of the lung may be single or multiple. The majority, by far, are found in the right lower lobe, the next most frequent site of occurrence is in the left lower lobe. As to their etiology, two schools of thought have been formulated, (1) those who believe abscess to be inspiratory in origin, and (2) those who believe them to be embolic. Both are correct and will account for the occurrence of the majority of pulmonary abscesses, in addition, they may arise from lymphatic extension, or they may, in a few cases, be the result of trauma externally. In support of the first theory, Richardson in 1912 reported the first cases of post-tonsillectomy abscesses, and later, Lord ascribed 34.3 per cent of his series of 227 cases to the result of this method of onset. Adding still more evidence to the inspiratory theory, Moore analyzed 202 cases in which he found that 41 per cent of the abscesses were in the right lower lobe and 19 per cent in the left lower lobe. Again, in the cases reported by Graham and Singer, 40 per cent of a series of 34 occurred in the right lower lobe, and Heuer, in a series of 42 cases found the abscesses of 21 in the right lower lobe. As early as 1913 Norris and Landis realized the importance of pneumonia as a causative agent, and they reported such pneumonic origin in 37 of a series of 100 cases. Chevalier Jackson repeatedly emphasized the necessity of considering foreign bodies as etiologic agents especially in children. Moreover, one may refer to the fine experimental evidence in favor of the embolic theory of such men as Fetterolf and Fox, Cutler, Schlueter, Holman, and Welelin. Therefore, we have come to find that the location of lung abscesses is dependent on the nature of its origin, as further shown in the following series of cases of Walker and Moore.

	Upper lobe	Lower lobe	Middle lobe
Post-operative	18	9	1
Post-pneumonic	24	44	3

The following cases are reported as being of the post-pneumonic and post-operative

groups respectively. They were selected because they exemplify the whole gamut of treatment, and because they illustrate how costly a comparatively simple error of judgement might be.

Case 1 This little girl, M. L. C., aged 5, was admitted 7/2/34 to the hospital with a dull constant pain in the right lumbar area. After confirming the diagnosis, she was subjected to appendectomy under ethylene anesthesia. The flat-plate roentgenograms of the chest and abdomen were reported negative pre-operatively. By the fourth post-operative day, she had begun to cough and there was x-ray evidence of a definite pneumonic area over the right base. Temperature gradually fell to normal by the tenth day, but there was a persistent greenish foul sputum. She was discharged from the hospital on the twelfth day to continue treatment at home.

Postural drainage Within two weeks, x-ray showed the abscess definitely and her doctor placed her on postural drainage. Fever continued from 99 to 101° F. and after poor results from this therapy she was referred for bronchoscopic drainage.

Bronchoscopy This was continued at intervals of two weeks for six weeks, but the x-ray showed extension of the original process.

Phrenicectomy This was performed 11/20/34 under local anesthesia in an effort to stop the pneumonic spread. There was no apparent decrease in the size of the cavity from this treatment.

Artificial pneumothorax This was the costliest error of all. She was given three of four refills of air into the right pleural cavity, but developed sudden pain and dyspnea with a resultant secondary empyema.

Closed drainage This was performed after readmission to the hospital 1/3/35. Her post-operative course was stormy, drainage from the wound was abundant, but her cough was increasing. Five transfusions were given totalling 1300 c.c. of whole blood which brought her red cell count to 441 million.

Open drainage with secondary operation

This was performed in an attempt to drain the abscess, but the drainage tubes only entered the pleural cavity. After one month, the tubes were removed while the drainage was still abundant and secondary incision and introduction of the tube was necessary. X-ray showed an empyema pocket and small multiple lung abscesses. At this time, one of us was called as consultant.

Thoracoplasty In addition to the abscess, this patient now had an empyema which needed treatment. Thoracoplasty in two stages was performed beginning with the first stage 4/29/35 and finishing one week later. The lower angle of the wound was packed open without suture to facilitate later approach to the lung. X-ray showed good collapse with obliteration of the empyema and her general condition improved as manifested by reduction of fever and cough and gain in weight.

Cautery lobectomy This was performed under ethylene anesthesia 5/30/35 by saucerizing the right lower lobe in two stages. She responded well after the first operation, but after skin flaps were dissected in the second, apnea developed with cyanosis and the anesthetist was unable to revive her. She expired 7/30/35 on the verge of cure. She had had close to thirty transfusions during her illness. Autopsy showed obliteration of the empyema pocket and all the abscesses except one small bronchiectatic pocket measuring 2 cm. in diameter. Death had resulted from asphyxia, as these patients do not tolerate cyanosis.

* * * * *

Case 2 In presenting this case, only the high points will be touched as it parallels the preceding case in some respects. This little girl, J. C., aged 7, developed a post-tonsillectomy pulmonary abscess in the left lower lobe 10/1/37. It was not diagnosed until 10/30/37 when she was placed at once on postural drainage. After one month when response was not deemed sufficient, bronchoscopic drainage was employed and repeated every two weeks for two months. Introduction of opaque oil in the bronchial tree at this time revealed a few smaller bronchiectatic abscesses in addition to the now-smaller original abscess. Without warning, on 3/13/38 she had a massive pulmonary hemorrhage and phre-

nicectomy (temporary) was performed the following day in an attempt to control it. After two transfusions her general condition had improved remarkably.

Excision lobectomy On 4/10/38 she was subjected to excision lobectomy of the left lower lobe. After removal of the lung, it was noted that the hemorrhage had come from a large branch of the left pulmonary vein. Convalescence was uneventful, the wound healed per primum and she was discharged from the hospital asymptomatic 5/25/38.

Discussion The treatment of acute abscesses differs greatly from chronic ones. Any abscess which dates back no longer than 8 to 12 weeks may be termed acute. It is estimated that 25 per cent are cured by merely rest and postural drainage. The results here are certainly better from hilar abscesses than peripheral ones due to the more direct path of exit for the pus. Drugs have also been used to allay the spirochetal forms of infection and neoarsphenamine is probably the most noteworthy, however it is not curative for the abscess. Vaccine and roentgen therapy have both had their advocates, but are for the most part undependable.

When rest and postural drainage fail, and within a reasonably short period of time, bronchoscopy should be tried. It will, of course, be more effective in single abscesses and especially those located centrally. There are many other advantages in bronchoscopy according to Graham, Singer and Ballon (1) it helps to rule out foreign body, (2) it excludes new growths, (3) it reveals bronchial stenosis, and (4) it reveals the nature of the surrounding pulmonary tissue.

Pneumothorax may be tried if the abscess is a hilar one, but as in the first case reported, rupture of the abscess is nearly bound to occur if peripheral. Low pressure should be used to prevent rupture and to prevent spread into other parts of the lung by shutting off bronchial drainage, or by compression of adjacent tissue. There is always the danger of air embolism, spontaneous pneumothorax, and the delays encountered in its administration, if it fails when surgical drainage could be effectively administered. Never use pneumothorax in extensive abscess formation due to the dangers of pulmonary gangrene. The results of pneumothorax are variable.

Whittemore and Balboni reported 18 cases of whom 7 died, Goldberg and Bluementhal had 16 cases and 2 died, Tewksbury reported 35 cases and 4 deaths (all his cases were under 6 weeks duration)

Surgical measures are used when the foregoing conservative measures fail. Thus surgery is adopted for this chronic abscess and in such acute cases where we suspect (1) the presence of ruptured putrid abscess with empyema, (2) any unruptured putrid abscess, (3) abscess with undue hemorrhage

The surgical treatment of choice after medical regime including bronchoscopy has failed is pneumonotomy or surgical drainage. This is most frequently afforded by a two-stage method in which the first stage is a simple thoracotomy for insuring adhesion formation between the lung and the chest wall. Gauze packs or other plombage material is used to pack into the wound. The time to undertake surgical drainage is after the abscess has formed a definite delimiting pyogenic membrane, thus insuring a safe localization, which certainly should have occurred by the 8th week or sooner. It is well to give medical treatment at least 12 weeks to accomplish what it will. The mortality of surgical drainage is high but will vary with the age. Lilienthal in 1928 showed a mortality of 42 per cent under 50 years and 63 per cent above 50. Muller's figures were 18.5 per cent and 62 per cent respectively for the same age limitation.

Phrenicectomy is used as an adjunct to other surgical measures but rarely alone. Moore reported 10 cases in which 4 were improved, 3 slightly improved, 2 dead and 1 other came to thoracoplasty and cauterization. Pneumonectomy Thoracoplasty should never be used for uncomplicated lung abscess. Thoracoplasty is the treatment for empyema complicating lung abscess and may be aided considerably by a phrenic interruption.

In empyema the treatment should be pointed for the empyema and if the abscess is single, it should clear up simultaneously, e.g. by collapse. Some form of collapse therapy is desirable and the most effective is an extra-pleural thoracoplasty in multiple stages. This may be combined with thoracostomy which should have been done beforehand. This may be aided by a phrenic interruption, although

Lilienthal believes there is little benefit from a phrenicectomy due to the thick exudate which may immobilize the diaphragm. Keller showed only a 7.5 per cent mortality in a series of 40 such cases because he kept open drainage through all the operative procedures, and although he had to resort to extensive scarification (including periosteum) of the pleura over the residual cavities. Collapse procedures should not be delayed long due to the imminent danger of brain abscess following a prolonged empyema. If there are multiple abscesses, the chances for return of function of that lung are slight and cauterization pneumonectomy should follow the last stage thoracoplasty. Usually the results from a single cauterization covering a wide saucer-shaped area would be sufficient to encourage drainage. The only complications are hemorrhage and broncho-cutaneous fistula, either of which rarely become enough of a menace to hazard to patient's welfare. If there is a residual pulmonary suppuration, a second or third cauterization may become necessary (or a sufficient number of times as seem expedient with cure) waiting about four to six weeks for an interval. Whenever the condition of the patient did not warrant extensive collapse measures, Lilienthal would institute open drainage and lavage daily with Dakin's solution. The quantity of drainage should be measured daily and lipiodol may be instilled to obtain an idea of the size of the residual cavity. When the cough and sputum are allayed and the anemia combated, more extensive collapse therapy may be then considered.

Conclusion

It was not the purpose of this paper to discuss details of operative technique, but rather to recapitulate briefly the present day modes of therapy in pulmonary abscess. Two cases are herein reported illustrating almost every phase of treatment afforded in lung abscess, calling attention to the errors of judgement in the treatment of each case. Approximately 25 per cent of cases of pulmonary abscess will clear up with rest and postural drainage alone. The rest must come to bronchoscopy before attempting collapse therapy. The most effective surgical treatment is pneumonotomy for the chronic abs-

cess When empyema complicates pulmonary abscess, it usually becomes necessary to utilize major collapse measures, this is preferably thoracoplasty It may become necessary to follow collapse by cauterization of the remainder of the necrotic lung

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An Intradermal Test for the Determination of Active Tuberculosis

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AS A RESULT of studies in homologous proteins and their reaction in the diagnosis of malignancy and pregnancy by the intradermal method, as described by one of us^{1 2}, an attempt was made to utilize this method for the diagnosis of tuberculosis With the clinical aid of Drs Louria, Bennett, and Schwartz this was made possible The material employed in the preparation of the extract is obtained from the tissue of guinea pigs, which have been previously infected with a suspension of tubercle bacilli in saline

Theoretical Considerations

The mechanism of the reaction of homologous proteins may be explained on the basis that this type of protein when introduced intradermally, acts as an antibody to the

antigen produced by the host during the active phase of the disease This differs from the Mantoux, etc^{3 4 5}, classical tests with tuberculin, in that instead of introducing an antigen, which is made up of tubercle bacilli and their products, depending on the antibodies of the patient to react to the antigen, in this case the antibody (the homologous protein) is introduced intradermally, depending on the antigen formed in the host during the active phase of tuberculosis to respond by the formation of pseudopodia

Material obtained from the blood of human tuberculosis has been tried, but has been abandoned because of the fact that the reaction might be due in some cases to species specificity Therefore, all our material has been obtained from guinea pigs, which are easily infected, and the material easily obtained, while a post mortem examination establishes whether or not they are in the active stage of tuberculosis

Preparation of the Homologous Protein

Healthy guinea pigs are isolated and placed in cages for a period of one week During this

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time they are weighed, their temperatures are taken, and blood counts are made on them, until it is established that they suffer from no infection. They are then inoculated with a suspension of tubercle bacilli in saline, and are allowed to remain for a period of from three to four weeks, during which time their temperature is taken every day and recorded, blood counts are made twice a week. After the third or fourth week (depending on the condition of the animal) they are anaesthetized and blood is taken from the heart with a sterile syringe and needle. This is placed in a sterile test tube, using a separate tube for the blood of each animal. The animals are then killed and posted. Only the blood of such animals as show active tuberculous infection is utilized.

The blood thus obtained is allowed to clot overnight. The serum is poured off and the clot, consisting of fibrin, blood cells, and hemoglobin, is placed in bolting cloth and washed in cold running water until the fibrin is perfectly white. In other words, the clot is cleaned of its hemoglobin and blood cells and only the fibrin is left. This is placed in four volumes of acetone for an hour, after which the acetone is decanted and an equal volume of fresh acetone is added and allowed to stand for twenty-four hours. The acetone is then poured off, and the fibrin dried in a vacuum pump until it is perfectly dry. It is then ready for extraction.

Preparation of the Extract

The fibrin is rubbed up in a mortar until it has been ground to a fine powder. This is dissolved in tenth normal sodium hydroxide in the proportion of one and one-half grams of fibrin to one hundred cc of tenth normal sodium hydroxide. The fibrin and sodium hydroxide must be thoroughly ground together. The solution of the fibrin in sodium hydroxide is then placed in a glass stoppered Pyrex container and allowed to stand for forty-eight hours. The container should be gently rotated a few times each day to keep the fibrin and sodium hydroxide solution thoroughly mixed, but it should not be shaken vigorously as we have found that this thickens the solution.

After forty-eight hours the solution of the fibrin in sodium hydroxide is placed in large

test tubes and is centrifuged at a speed of 2500 R.P.M. for thirty minutes. The supernatant fluid is then pipetted off and is filtered through a coarse Berkefeld filter. The filtrate is then neutralized and adjusted to a pH of 6.9 with an acid buffer made as follows:

KH_2PO_4 (anhydrous)	2.27 grams
HCl (Sp. G. about 1.19, 35%)	4.235 cc
Distilled water to make one liter	

The extract is then placed in sterile pyrex containers to which is added a mixture of one part tricresol to three parts glycerine, in the proportion of two drops of the mixture to each ten cc of the finished extract. The extract containers are then capped with sterile rubber stoppers and thoroughly shaken to dissolve the preservative. A sterile needle is then introduced into the stopper to allow the escape of excess air formed by the shaking.

The extract is then heated for fifteen minutes in a water bath, the temperature of which is 80° centigrade. The solution is then allowed to cool. It is placed in the ice chest for a week, after which the pH is checked again. If any changes have taken place, the pH is corrected and the solution allowed to stand for another week, after which the pH is again determined and corrected if it has changed. Since the pH is of great importance in the correctness of the test, it is best to adjust the pH at these one week intervals until the pH remains constant at 6.9. We found that the only condition which renders the results of this test inaccurate is a change in pH of the extract. The above precautions have therefore been devised. We found it best to use the spot plate method until the last determination has been made, after which the final result is checked by the potentiometer. It is very important that no air be blown into the container when introducing the needle. The plunger of the syringe should therefore be pushed entirely in to the zero mark before introducing the needle into the rubber cap of the container.

Method of Performing Test

The test is performed by the intradermal injection of the extract described above. For the injection a one cc tuberculin type syringe with a one-half inch number 27 gauge

needle may be used to best advantage. The area best suited for the injection seems to be that on the antero-medial aspect of the upper arm over the biceps muscle in a region which is free from superficial veins. The skin is lightly wiped with alcohol and then as lightly wiped dry with a sterile gauze sponge. With the skin kept firm, but not taut, the needle is held parallel to the skin and passed into the epidermis at such a depth that the point is visible at all times. Inserting the needle about $\frac{1}{8}$ th of an inch, so that the eye is covered, usually suffices. One-tenth c.c. of the extract is then injected very slowly, so that a perfectly round wheal with smooth edges is formed by the injection. The needle is then withdrawn, and the forearm is flexed across the chest or in the lap of the patient so as to keep the skin relaxed and not under tension, and to prevent the extravasation of the fluid. Readings may be made in from two to five minutes. Positive tests will show very definite pseudopodia. Negative tests show no such reaction, remain perfectly even at the margin of the bleb and are soon resorbed. A more detailed description has been given by Gruskin in his previous papers^{1, 2}, on the intradermal tests, and by Schwartz⁶.

Although the technique of the test is simple, carelessness will lead to incorrect results. A few factors leading to wrong diagnoses may be enumerated as follows:

1 Making the injection too deeply or too superficially. This will tend to obscure the formation of pseudopodia.

2 Pressure of the fluid during injection. The injection should be made as slowly as possible so that there is no undue pressure of fluid which may tend to cause false pseudopodia to appear. The bleb formed by the injection should be perfectly round and smooth at the margin when the injection is just finished. If it is not round the injection should be repeated.

3 Size of the needles. The needles should not be larger than 27 gauge, as larger needles will not allow the injection to be superficial enough, and the amount of fluid entering in a given time will cause false pseudopodia to appear during the injection.

4 Proper preservation of the antigen. The extract which is used in this test must be kept in an ice chest or refrigerator at all times

when it is not being used. If exposed to warm air for a long period of time the pH of the extract should be checked. The proper pH is 6.9. It is also important to avoid blowing air into the extract vial as we have found that this, too, may change the pH in time. The plunger of the syringe should be kept at the zero mark when introducing the needle into the rubber cap of the bottle containing the extract.

Contraindications to the Test

There are a few conditions which interfere with intradermal testing. These conditions necessarily interfere with this test. The most important factor influencing wheal formation is the state of circulation of the tissues, according to Coca, Walzer, and Thommen.⁷ Those conditions which diminish or increase the rapidity of blood flow likewise alter wheal formation. Similar changes take place when the skin has been injured recently as in the case of sunburn, x-ray or radium as well as with extensive skin lesions either of the hyper or hypokeratotic type. According to R. A. Cooke⁸, repeated tests with the same atopen at the same skin site will result in a non-specific exhaustion of the tissue and hence diminish the skin reaction.

Exaggerated dermographic responses have been found by Lewis in some normal individuals.⁹ This is rarely elicited in a carefully given intradermal injection where the trauma is minimal. If there is a dermographic response, a control will cause the same reaction. It is essential, therefore, that a control be used at all times. Such a control should not only be equivalent to physiological saline, but should have the same nitrogen content and the same pH as the testing solution. This may be made from the blood fibrin of normal guinea pigs in the same manner as described above for the original extract.

The skin of some individuals may contain a large amount of loose connective tissue in the superficial layers. This will allow the testing solution to spread and permit false pseudopod formation. In such cases it is necessary to introduce the extract slightly deeper.

All these factors should be taken into consideration when using any form of intradermal test.

Summing up briefly, the contraindications to this test are

1 Diminished blood flow in the tissues as in edema, cardiac decompensation, etc

2 Marked dehydration

3 Recent sunburn or radium and x-ray treatments and extensive skin lesions as described above

4 Increased dermographic response as determined by the use of a suitable control

5 Increased amounts of loose connective tissue in the skin, causing premature spreading of the injection fluid. Injections should then be made slightly deeper

6 In endocrine disturbances and hypersensitive skins

7 In febrile and inflammatory conditions

8 In the presence of excessive heat, which may soften the skin and lead to false results. Always cool such skins with cold towels before testing

9 Lastly, the syringe should be completely filled to the 0 1 c c mark before injection so that no air is blown in with the injection, because this will definitely cause the formation of false pseudopodia

Once these factors have been eliminated, the test will give correct results providing the other factors, i.e. proper extract and correct technique, are used as aforementioned. This may be verified by the series of cases analysed in this paper

It is interesting that in our experience with this test we have found that some tuberculous patients, after undergoing a period of treatment will at one time or another show a weakly positive or negative reaction during the quiescent stage of the disease, yet are liable to show a positive reaction when the test is performed a few days later. This is evidently the result of lack of antigen formation at that period. Therefore, we have made it a rule not to pronounce a patient inactive unless four negative reactions have been obtained, having been tested once a week for a period of four weeks. Of course, this last applies only to patients under treatment, as rest, nourishment, etc., tend temporarily to quiescence of activity and antigen production. As a diagnostic measure, provided that all contraindications have been observed, we

have found that a positive reaction represents active tuberculosis and a negative reaction shows non-activity

Summary

The usefulness of this test is evident from the above description. First, because activity or non-activity of a case of tuberculosis can be determined. Second, because this reaction is not dependent on the antibody response of the patient for its manifestation, and hence will give a positive reaction in miliary tuberculosis and tuberculous meningitis, which usually give negative reactions with the older tests on account of the lack of immune bodies. Third, the fact that the reaction may be read in a few minutes makes it more applicable especially in group examinations. Fourth, there is no possibility of stirring up a latent infection as is sometimes the case with an antigen made from tubercle bacilli. A fifth advantage of the test is that it will give a negative reaction in a non-active case, in contradistinction to the older tests which usually continue to give positive reactions even when the patient is clinically well, after having been once infected.

Tests were performed on chest cases with the following results

	Cases	Correct
Temple University Hospital and Clinic and Eagleville Dispensary	200	95%
Brooklyn Tuberculosis Hospital by L B and S	150	92%
Northeastern Hospital Chest Clinic by Dr S F Madonna Phila	135	95%
Paris Hospital Paris Ill by Dr H D Junkin	100	96%

All these cases were checked by x-ray, sputum examination or guinea pig inoculation. In addition to tuberculosis of the chest the following conditions were found

Cases
Tuberculous iritis
Acute tuberculous choroiditis
Tuberculous irido-cyclitis
Tuberculous meningitis
Tuberculosis of the gastro-intestinal tract
Tuberculous peritonitis
Tuberculosis of the kidney
Miliary tuberculosis

Negative reactions were found in the following types of cases

Cases
Carcinoma of the lung
Lung Abscess
Asthma

	Cases
Bronchopneumonia	1
Pneumonitis	1
Lobar pneumonia	2
Non-tuberculous infection of the parotid gland	1
Pyelitis, non-tuberculous	1
Chronic atrophic arthritis	2
Old case of Pott's disease of the spine, cured fifteen years	1

References

- 1 Gruskin, Benjamin, *An Intradermal Test for the Determination of Malignancy* (J Lab and Clin Med., 17, 12, Sept., 1932)
- 2 Gruskin, Benjamin, *An Intradermal Test for Pregnancy* (Am J Surgery, 3, 59, Jan., 1936)
- 3 Mantoux, Compt Rend Acad d Sc, Aug, 1908 Soc de Biol, July, 1909
- 4 von Pirquet, Berl Klin. Wschr, 48, 644 1907, Med Klin, 40, 1907
- 5 Moro, Munchen Med Wchnchr, p 216, 1906
- 6 Schwartz, E *The Gruskin Intradermal Test for Pregnancy* (Am J Surgery, 33, 2, 225, Aug., 1936)
- 7 Coca, Walzer and Thommen, *Asthma and Hay Fever in Theory and Practice* (Springfield Ill, 1931, Charles C Thomas)
- 8 Cooke, R A, New York Med J, 7, 119, 1922
- 9 Lewis, Thomas *The Blood Vessels of the Human Skin and Their Responses* (London, 1921, Shaw and Sons, Ltd)

Eighty-Eighth Annual Meeting of the Pennsylvania State Medical Society

Scranton, Pennsylvania

October 3-6

TUBERCULOSIS DAY - OCTOBER 6th

9 A M, Auditorium, Masonic Temple

Pathology, Symptoms, and Diagnosis of Pulmonary Tuberculosis (20 minutes)

DR JULIUS L WILSON, WEST HAVEN, CONN

Treatment of Pulmonary Tuberculosis (Lantern Demonstration) (10 minutes)

DR FRANK WALTON BURGE, PHILADELPHIA, PA

10 30 A.M, Norman Hall, Masonic Temple Round Table Conference on Tuberculosis (90 minutes)

In charge of

DR JULIUS L WILSON, WEST HAVEN, CONN—DR FRANK WALTON BURGE, PHILADELPHIA, PA—DR JOSEPH W POST, PHILADELPHIA, PA—DR EDMOND R LONG, PHILADELPHIA, PA

NOTE In the afternoon the Fall Meeting of the Board of Directors of the Penn-

sylvania Tuberculosis Society will be held

7 30 P.M Tuberculosis Dinner Dr LOUIS CLERF, PHILADELPHIA, PA, Toastmaster Speakers

Dr Edith MacBride-Dexter, Pa Secretary of Health, subject The Pennsylvania Plan for Tuberculosis,

Dr Esmond Long, Director of Henry Phipps Institute, Philadelphia, subject Case Finding Under the Pennsylvania Plan and Attitude of the National Tuberculosis Association to the Pennsylvania Plan,

Dr Frank Walton Burge, Philadelphia, subject Cooperation of Tuberculosis Agencies Under the Pennsylvania Plan,

Dr Champneys H Holmes, President of the American College of Chest Physicians, Atlanta, Ga, subject Attitude of Other States to the Pennsylvania Plan for Tuberculosis

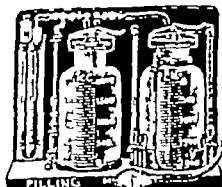
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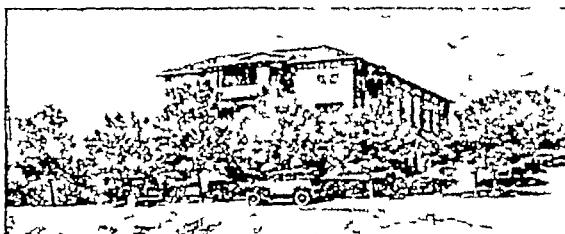
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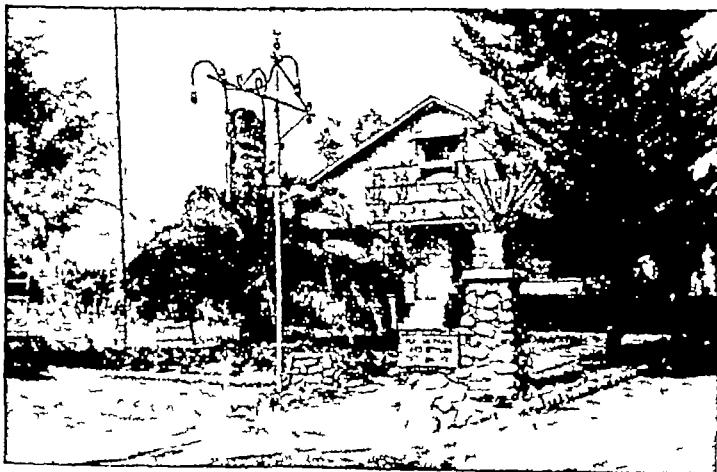
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MEDICAL DIRECTOR

Organization News

Committee on Tuberculosis Organization

The Committee for the Advancement of Tuberculosis Organization in Medicine of the American College of Chest Physicians announces the release of its program for this year. Letters have been mailed to the forty nine Governors of the College outlining the following purposes of the committee and the procedure.

"It is the purpose of the Committee for the Advancement of Tuberculosis Organization in Medicine to set up in each State Medical Society a Committee on Tuberculosis. Wherever possible it is suggested that the Chairman and the other members of the Tuberculosis Committee of the State Medical Society be duly elected Fellows of the American College of Chest Physicians (This is what is known as the 'Pennsylvania Plan'). The plan was presented by Dr. Frank Walton Burge, Philadelphia, Pa. before the meeting of the American Medical Association in General Assembly at San Francisco, California, June 14, 1938.)

Following the general idea of the 'Pennsylvania Plan', it is proposed that the State Tuberculosis Committee proceed to organize a Tuberculosis Committee in each County Medical Society within the State. Wherever possible the Tuberculosis Committee of the County Medical Societies should be composed of Fellows of the American College of Chest Physicians.

It should be the duties of these committees to make a study of the facilities within their respective states and counties for the treatment of tuberculosis and other lung diseases, to cooperate with all existing agencies for the improvement of conditions when necessary, to pay particular attention to the medical needs of the patients, and to look after the welfare of the physicians engaged in the specialty of chest diseases both in and out of sanatoria."

Submitted to the Governors of the American College of Chest Physicians by

Ralph C. Matson, M.D. Frank Walton Burge, M.D.
Chairman Vice-Chairman
Portland, Oregon Philadelphia, Pa.
Louis F. Knoepp, M.D. Fred M. F. Meixner, M.D.
Beaumont, Texas Peoria, Illinois
Edward J. Murray, M.D. Paul H. Ringer, M.D.
Lexington, Kentucky Asheville, N.C.
Fred A. Slyfield, M.D. Chas. C. Trembley, M.D.
Seattle, Washington Saranac Lake, N.Y.
Wm. C. Voorsanger, M.D.
San Francisco, Calif.

Members of the Committee for the Advancement of Tuberculosis Organization in Medicine will assist the Governors of the following states in establishing such committees in the states where committees do not now exist.

Chas C. Trembley, M.D.	Frank Walton Burge, M.D.
New York	Pennsylvania
Rhode Island	New Jersey
Connecticut	West Virginia
Massachusetts	Ohio
New Hampshire	Delaware
Vermont	Maryland
Maine	District of Columbia
Paul H. Ringer, M.D.	Edward J. Murray, M.D.
Florida	Kentucky
Georgia	Tennessee
S. Carolina	Mississippi
N. Carolina	Alabama
Virginia	Oklahoma

Louis F. Knoepp, M.D.
Texas
Louisiana
Arkansas
Kansas
Missouri

Fred A. Slyfield, M.D.
Washington
Oregon
Montana
Idaho

Ralph C. Matson, M.D.
U.S. Possessions
Mexico

Wm. C. Voorsanger, M.D.
California
Arizona
New Mexico
Colorado
Utah
Fred M. F. Meixner, M.D.
Illinois
Iowa
Indiana
Michigan
Wisconsin
Minnesota
Nebraska

Committee on Medical School Education

Dr. E. W. Hayes, Monrovia, California, Chairman of the Committee on Medical School Undergraduate Teaching of the American College of Chest Physicians announces that the following Fellows of the College will comprise the committee for this year.

Dr. John Alexander, Ann Arbor, Michigan
Dr. A. J. Cohen, Philadelphia, Pa.
Dr. Benjamin Goldberg, Chicago, Illinois
Dr. Jay Arthur Myers, Minneapolis, Minn
Dr. John H. Peck, Oakdale, Iowa
Dr. William Atmar Smith, Charleston, S.C.
Dr. Sam'l H. Watson, Tucson, Arizona

Dr. Hayes has outlined the program of this committee in his presidential address, delivered before the Fourth Annual Meeting of the American College of Chest Physicians at San Francisco in June of this year. The address was published in the July Issue of *Diseases of the Chest* and reprints may be had upon request.

The committee will work towards the improving of the teaching of diseases of the lungs in those medical schools which are not up to standard.

Statistical Committee

Dr. J. Winthrop Peabody, Washington, D.C., Chairman of the Statistical Committee of the American College of Chest Physicians announces that the following Fellows of the College will serve on the committee for this year.

Dr. Sydney Slater, Worthington, Minn
Vice-Chairman
Dr. John Allen, Omaha, Nebraska
Dr. G. C. Bellinger, Salem, Oregon
Dr. Byron Harman, Verona, N.J.
Dr. Elmer Hightberger, Oil City, Pa.
Dr. Arthur D. Long, El Paso, Texas
Dr. William D. Winn, Springville, Calif.

The committee will continue to gather information on the progress of collapse therapy in

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J. E. POTTENGER, M.D. Asst. Medical Director and Chief of Laboratory
LEROY T. PETERSEN, M.D. Asst. Physician and Roentgenologist
F. M. POTTENGER, JR., M.D. Assistant Physician

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SISTER MARY EDWARD, Superintendent

E. W. HAYES, M.D., Medical Director



tuberculosis, facilities for the care of the tuberculous, and will include this year, a survey of the salaries paid to physicians who are resident at or affiliated with tuberculosis sanatoria, and the housing facilities available for resident physicians. This latter survey will furnish the information to the Committee for the Advancement of Tuberculosis Organization in Medicine and it will be the first step toward securing adequate salaries, where needed, and proper housing conditions for physicians who are affiliated with the sanatoria of this country.

SOCIETY NEWS

Announcement

Dr Champ H. Holmes, President of the American College of Chest Physicians was married on August 25th to Lena Jacqueline Swift at Atlanta, Georgia.

Dr Martin Henry Collier, Lakeland Sanatorium, Grenloch, N. J., has been appointed Governor of the American College of Chest Physicians for the State of New Jersey.

Dr Mildred E. Thoren, Weimar, California, a Fellow of the American College of Chest Physicians and the staff of the Weimar Sanatorium presented a symposium on compression therapy before the Placer County Medical Society at a recent meeting.

Dr Paul H. Ringer, Asheville, North Carolina, Regent of the American College of Chest Physicians, addressed the Greene County Medical Society, Greenville, Tennessee. Dr Ringer spoke on the "Early Diagnosis and Treatment of Tuberculosis".

Dr Jay Arthur Myers, Minneapolis, Minnesota, Regent of the American College of Chest Physicians, was a guest speaker at the Mississippi Valley Tuberculosis Conference held at St. Louis, September 21-24. Dr Myers presented a symposium on the "Modern Concepts of Tuberculosis". Dr Vera V. Norton, Cincinnati, Ohio, a Fellow of the American College of Chest Physicians is the President of the Association.

Dr Arnold Shamaskin, Bedford Hills, New York, a Fellow of the American College of Chest Physicians, has resigned as the medical superintendent of the Montefiore Hospital Country Sanatorium, Bedford Hills, to become superintendent and medical director of the Jewish Consumptives Relief Society Sanatorium at Spivak, Colorado.

Dr Byron F. Francis, Seattle, Washington, a Fellow of the American College of Chest Physicians, presented a paper before the meeting of the Washington State Medical Society at Belling-

ham. The title of his paper was, "Recent Advances in our Knowledge of Pulmonary Emphysema".

Pennsylvania Tuberculosis Committees Completes Organization

Dr Frank Walton Burge, Philadelphia, Pa., Chairman of the Committee on Tuberculosis announces the names of the following physicians who comprise the State Committee and the chairmen of the county committees.

STATE COMMITTEE

JOHN H. BISBING M.D.	Reading
ROYAL H. McCUTCHEON M.D.	Bethlehem
SYDNEY J. HAWLEY M.D.	Danville
CLARENCE R. PHILLIPS, M.D.	Harrisburg
J. PAUL FRANTZ, M.D.	Clearfield
ROSS K. CHILDERHOSE M.D.	Allenwood
VICTOR M. LEFFINGWELL M.D.	Sharon
O. S. KOUGH, M.D.	Uniontown
CHARLES C. ROSS, M.D.	Clarion
C. HOWARD MARCY, M.D.	Pittsburgh
CHARLES H. MINER, M.D.	Wilkes-Barre

COUNTY COMMITTEE

DR. WILLIAM J. BIERER	Kittanning Pa.
Armstrong County Medical Society	
DR. RUTH W. WILSON	Beaver, Pa.
Beaver County Medical Society	
DR. JOHN H. BISBING	Reading, Pa.
Berks County Medical Society	
DR. JOHN T. SCHAFER	Sellersville, Pa.
Bucks County Medical Society	
DR. J. PAUL FRANTZ	Clearfield, Pa.
Clearfield County Medical Society	
DR. DAVID S. STEYER	Mt. Holly Springs Pa.
Cumberland County Society	
DR. CHAS. S. AITKEN	Brookline Pa.
Delaware County Medical Society	
DR. O. S. KOUGH	Uniontown, Pa.
Fayette County Medical Society	
DR. W. C. SCHULTZ SR.	Waynesboro, Pa.
Franklin County Medical Society	
DR. WILLIAM A. DOEBELE	Huntingdon, Pa.
Huntingdon County Medical Society	
DR. FRANK C. WAGENSELLER	Richfield, Pa.
Juniata County Medical Society	
DR. PAUL C. McANDREWS	Scranton, Pa.
Lackawanna County Medical Society	
DR. ROBERT M. OLSEN	Palmira, Pa.
Lebanon County Medical Society	
DR. CLYDE H. KELCHNER	Allentown Pa.
1225 Turner Street	
Lehigh County Medical Society	
DR. C. H. MINER	Wilkes-Barre Pa.
Luzerne County Medical Society	
DR. S. B. GIBSON	Williamsport, Pa.
Lycoming County Medical Society	
DR. FRANCIS DE CARIA	Bradford, Pa.
McKean County Medical Society	
DR. R. H. McCUTCHEON	Bethlehem, Pa.
Northampton County Medical Society	
DR. CHRISTIAN NISSLER	Philadelphia Pa.
Philadelphia County Medical Society	
DR. J. STRATTON CARPENTER	Pottsville, Pa.
Schuylkill County Medical Society	
DR. ELMER HIGHBERGER	Oil City Pa.
Venango County Medical Society	
DR. A. C. VOIGHT	Hawley, Pa.
Wayne-Pike County Medical Society	
DR. H. MALCOLM READ	York, Pa.
York County Medical Society	

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HENRY W LEETCH, M.D., and JOHN N HAYES, M.D., FACP,
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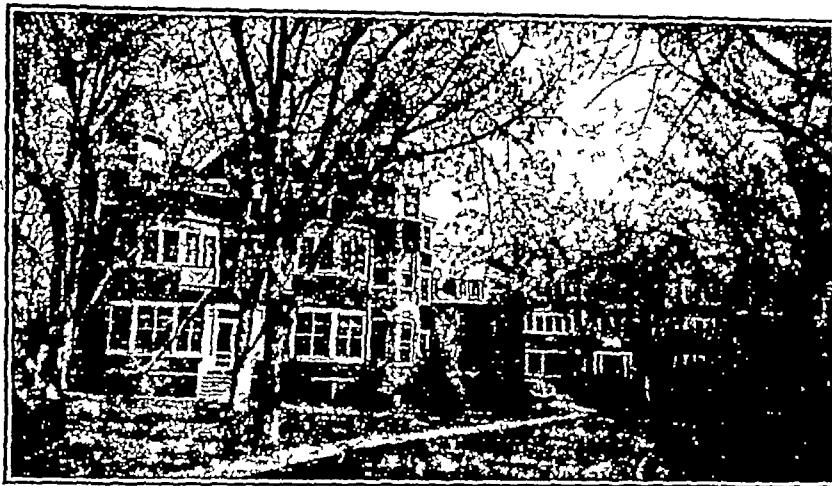
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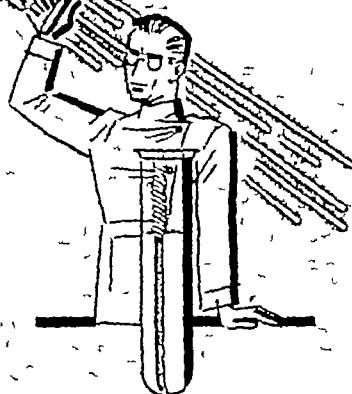
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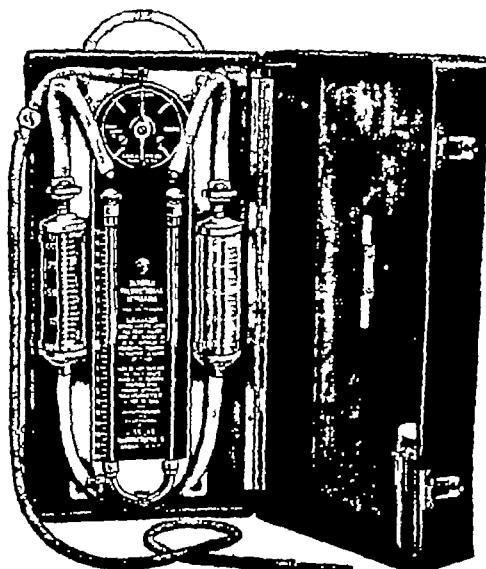
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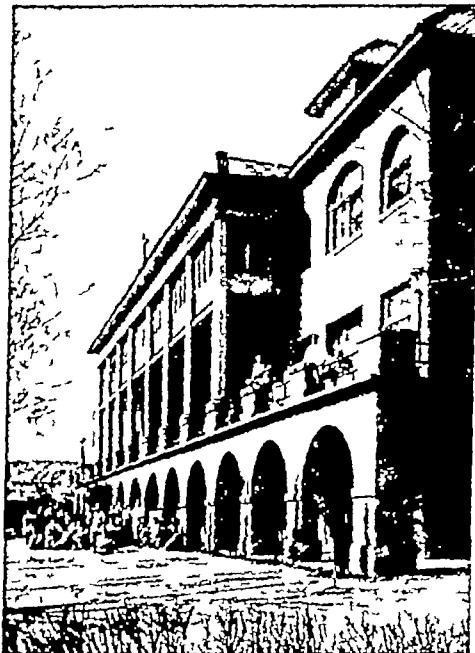


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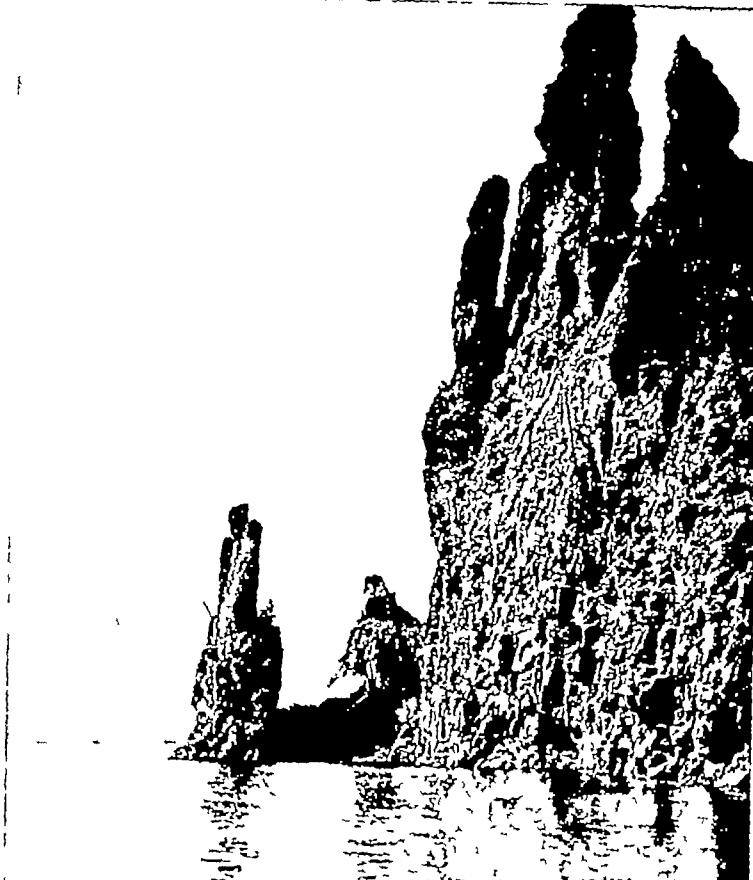
OCTOBER

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Sanatorium Digest

Volume I.

Number 10



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Official Organ of the Amer College of Chest Physicians
 Editorial offices 1018 Mills Building, El Paso, Texas
 Business Address P O Box 1069, El Paso, Texas
 MEMBER ASSOCIATED EDITORS OF TUBERCULOSIS PUBLICATIONS

(A MONTHLY PUBLICATION)

Subscription United States and
 Canada \$2.00 per year Other
 countries \$2.50 per year
 Entered as second-class matter
 August 18 1936 at the post office
 at El Paso Texas under the Act
 of August 24 1912



Editorial Comment

"DUMMY DIRECTORS" Dummy directors are a disease which sometimes afflicts organizations

It is caused by the simbiosis of a doctor suffering from an indiscriminating desire for free advertising, and the desire of a layman who covets power over affairs medical to which he, a layman, is not entitled by the Constitution and By-Laws under which such a lay employee works

The layman says to the doctor, "We want you on our Board of Directors" "No," says the doctor, "I have no time to devote to work in which I am not primarily interested" Of course, that is why the layman chose him "Don't let that worry you, doctor, we will do all the work, and you will get the credit"

So the doctor snatches a little cheap publicity to which he is not entitled, and lives a lie, in that he actually directs nothing

Rest assured, Doctor Dummy Director, you maintain your position only because you are considered too stupid or disinterested to know what is going on in the organization

Resign, regain your self-respect, and the respect of the members of your profession who know what it is all about Make room for the specialist whose life work is to direct such enterprise

When a chest specialist is invited to be a

director of an X-ray Organization, of a Cancer Research Institute, of a Heart Association, or of some other beneficial set-up entirely apart from his specialty, which his superiors in those avenues of activity passed by, I hope his common sense gives him wits enough to recognize the insult to him and his profession

Be too proud of your profession to be a Dummy Director'

Direct or Resign!

F W B

EXAMINE THE SPUTUM Every doctor who would make any kind of an examination of a patient for pulmonary tuberculosis, should also examine the sputum It is most simple, and by doing it yourself, the trouble and unnecessary waiting incident to forwarding a specimen to the state laboratory is obviated Repeated examinations are indicated in many cases It is a safe rule that the sputum should not be considered negative for tubercle bacilli unless several specimens have been rather meticulously searched Any doctor who has the equipment to make an examination of the urine or to examine a blood smear has the essentials for examining the sputum for tubercle bacilli A microscope, glass slides, a flame and a bottle or two of simple stains complete the required outfit There is no need here to go into the details of this laboratory examination These

can be obtained from almost any textbook or laboratory manual. In practically every community there are open, far advanced cases of pulmonary tuberculosis. Would this were not so, but unfortunately it happens to be. Happily, however, for our purpose at hand, it may serve in a helpful and practical way. The practitioner can perfect himself in the staining technic of tubercle bacilli from this known positive source. Once this has been attained, the feeling of assurance, yes, independence, is most comforting. You have acquired the possession of a most potent means of investigation, and one that reaches into the shadows of one of mankind's greatest scourges.

One or two more bottles of chemical reagents, a centrifuge, and the set-up for performing the concentration method is at hand. This is a more accurate and refined method for finding the tubercle bacillus in the sputum and should be employed when the examination is negative by the usual direct method. Here again, any laboratory manual will give the details of this procedure. While it is very true that pulmonary tuberculosis frequently exists when no tubercle bacilli can be demonstrated in the sputum—and it is profoundly hoped that continued efforts will be directed to diagnose it more often at such time—it can be stated that the presence of tubercle bacilli in the sputum practically always means the existence of pulmonary tuberculosis. It is one of the most positive proofs in all medicine. Therefore it behooves every doctor to equip and perfect himself for the examination of the sputum for tubercle bacilli. Unlock the door to the puzzle of the open case of pulmonary tuberculosis. You have the key.

C H H

B. C. G. Dr Thorvald Madsen, director of the State Serum Institute of Denmark, discussed B C G in a recent lecture under the auspices of the Abraham Flexner Lecturship at the School of Medicine, Vanderbilt University. In his opinion, there appears to be no danger in its use, when the proper precautions are observed. He feels that now there has been enough accumulated evidence to show that B C G increases the resistance to tuberculous infection. He notes that its use is being gradually extended and raises the question of whether it should be more wide-

ly used. He closes his lecture with this significant statement: "At present it seems to me, it might be too risky, even if it were practicable in a few places, to eradicate tuberculosis entirely, but preferably to modify the course of this infection in such a way that it becomes protective instead of destructive."

C M H

RED CROSS FIGHTS TUBERCULOSIS ABROAD

In Peru, the Red Cross has completed plans, and is now building a pavilion of 50 beds for tuberculous children.

In San Salvador, the Red Cross has established an anti-tuberculosis dispensary which is worthy to rank with the best.

In Norway, the Red Cross has been constantly extending its health activities to include preventative work against tuberculosis.

In Australia, the most characteristic work of the Red Cross is the care of crippled children and tuberculous patients.

C M H

RESOLUTION The American College of Chest Physicians, in Annual Session at San Francisco, June 12, 1938, passed a resolution expressing its opposition to any measure such as the proposed "State Humane Pound Act" which will hinder or curtail animal experimentation as conducted by fully qualified physicians.

Progress in medicine and in the sciences has been possible because of the use of living animals for experimentation. Any move to prevent the use of such animals for the benefits of science is opposed by organized medicine as a step backward in our modern civilization.

Therefore, the American College of Chest Physicians desires to go on record, and joins with other organized medical groups in opposing this proposed legislation.

Victor S Randolph, M.D., F.A.C.S.

Chairman, Phoenix, Arizona

Walter E. Vest, M.D., F.A.C.P.,
Huntington, West Virginia

Alexius M. Forster, M.D., F.A.C.P.,
Cragmor, Colorado

By Robert B. Homan, Jr., M.D.,
Secretary, American College of
Chest Physicians, El Paso, Tex

Dated August 16th, 1938

ALLERGY IN TUBERCULOSIS We have been just a little too prone to consider the allergic side of the tuberculous problem as of theoretical and academic importance only. Actually, it is of practical and vital significance. Without getting into the theoretical aspect of the question, we know that during the process of repair, that it, during the process of recovery, and actually after arrest of the disease, that the tuberculin reaction is the strongest. It is in the recovering or the recovered cases that we find clinical allergy in the form of asthma, hay fever, etc.

When these frank clinical aspects of allergy exist the entity is recognized and understood and is then only a clinical problem. There are, however, definite allergic phases to the management of the recovery stage of tuberculosis that can escape attention and recognition and that are fraught with dangers and even disastrous results.

Take the problem of so called pleural shock. I cannot say what has occurred in the other fellow's case of pleural shock, but I have studied my own cases carefully. Some of my cases of so called pleural shock unquestionably have been due to air embolism. Such cases, however, are irrelevant to this discussion. I am confident that idiosyncrasy to novocain was the cause of the shock that existed in all of my own series not attributable to air embolism. Landsteiner has proven that drug idiosyncrasy is true allergy. I have observed anaphylactic shock in surgical procedures on the tuberculous not involving the pleura, in two cases I am now treating a nurse for seasonal hay fever who told me that during the year she took artificial pneumothorax and that she "passed out" at each refill. The doctor thought it was pleural shock, but when she called attention to the fact that she frequently had "passed out" before he started the pneumothorax refill, she was told that it was "nerves." One of my colleagues, in reporting a case of pleural shock a year ago, stated that he had not yet pierced the parietal pleura with the needle when the seizure occurred. I am, therefore, convinced that at least some cases of so called pleural shock are due to drug allergy.

Many men treating tuberculosis have had

crises occur following the administration of horse serum and other protein substances introduced as coagulants in hemoptysis. Perplexing crises have occurred following the administration of aspirin, quinine, and other drugs that quite definitely point to the possibility of the allergic phenomenon.

The second thing that I would call attention to is the shock that quite frequently follows transfusion in the tuberculous, seen most often when transfusion is part of the after treatment following thoracoplasty. These shocks occur in cases in which there is no question, but what the typing has been carried out accurately I think it is far fetched to consider the shock as due to the foods that the donor may have eaten prior to the transfusion. I think we should be conscious of a much more probable allergic cause the possible sensitivity of the patient to foreign blood serum, even though it be human and meets our arbitrary requirements from the standpoint of typing. Another is that in any form of indirect blood transfusion there is bound to be a certain amount of destruction of red blood cells. Dead red blood cells produce foreign protein reaction, and when this occurs in the highly allergic case, such as we are so very liable to find in the old tuberculous case that has come to thoracoplasty, I think it is easy to explain some of the shocks and crises that accompany blood transfusions in these cases.

I believe we cannot over emphasize the importance of possible sensitivity of an allergic sort in the chronic tuberculous.

"Medicine without ideals and without ethics ceases to be a profession," said Irvin Abell, President of the American Medical Association. This statement is very significant in view of the current threat of state medicine. Does state medicine mean a politically stimulated doctorate and a consequent abolition of ideals and ethics, or does it mean freedom from financial worries and a chance to really practice the medicine of ideals and ethics? We wish we knew the answer.

Carbon Dioxide Inhalation in Pulmonary Tuberculosis

ANDREW L BANYAI, M.D.*
Wauwatosa, Wisconsin

THE treatment of pulmonary tuberculosis is passing through a phase in which a great deal of attention is being paid to all types of mechanical and surgical measures. At the same time, certain so-called medical problems of the disease are not given adequate attention. I am referring here particularly to the management of cough and the treatment of dyspnea. An intelligent and efficient management of these conditions is impossible unless one knows their causes, severity, frequency, duration, and the patient's pulmonary and general status.

Four years ago I published a communication on the use of carbon dioxide inhalations in pulmonary tuberculosis.¹ At that time, on the basis of my clinical experience, I arrived at the following conclusions: 1. The administration of a mixture of 10 per cent carbon dioxide and 90 per cent oxygen by means of repeated inhalations was found to be a safe procedure in pulmonary tuberculosis.

2. The most consistent benefits derived from this treatment were (a) easy, effortless expectoration, (b) diminution of cough, and (c) relief from dyspnea.

3. Concomitant beneficial results were (a) sustained rest for the diseased lung during the absence of cough, (b) better and more relaxed sleep, (c) improvement in the general well-being, (d) better appetite, and in some cases relief from laryngeal pain.

4. The inhalation of carbon dioxide not only alleviates distressing cough but also enables one to reduce the consumption of narcotics and expectorants in such cases.

The clinical application of this treatment was based on the use of carbon dioxide inhalations in conditions characterized by an inadequacy or embarrassment of respiration and on data concerning functional changes in the lung and its subdivisions under the effect of these inhalations. Haldane and

Priestly² were the first who demonstrated the importance of carbon dioxide in the control of respiration. To Henderson³ goes the credit for being the first who suggested its therapeutic application. In 1920 Henderson and his associates⁴ recommended its administration after operations. Subsequently⁵ the inhalation of a mixture of carbon dioxide and oxygen was proposed for the treatment of carbon monoxide poisoning. When inhalational treatment is given in such cases, the respiratory center is stimulated, and consequently the oxygen intake and the carbon monoxide elimination are increased. An additional benefit is the prevention of post-asphyxial pneumonia, a complication that occurs in about one-third of the severely gassed cases. The beneficial influence of carbon dioxide inhalations in ether and alcohol intoxication, morphine poisoning, resuscitation after drowning and electric shock, and resuscitation of new born babies are attributable to the stimulation of the respiratory center. The inhalations were found to be of value in the prevention of postoperative massive atelectasis⁶ and in counteracting hypostatic pulmonary congestion.⁷ Because of the fact that the coronary arteries dilate under the effect of carbon dioxide inhalations, their use for checking attacks of angina pectoris was also suggested.⁸

The direct effect of these inhalations upon the bronchi was studied by Brown⁹. His bronchoscopic examinations on patients receiving carbon dioxide-oxygen inhalations revealed that as the result of the increase in the depth of breathing, the walls of the bronchi approximate one another, and in this manner tend to free any secretion attached to the wall. Furthermore, he saw a definite blanching of the mucous membrane and violent movements of the bronchial tract. Prinzmetal and his associates¹⁰ presented experimental evidence that the inhalation of carbon dioxide increases the negativity of the intrapleural pressure. I¹ was able to demon-

* Department of Medicine Marquette University Medical School, Milwaukee, Wisconsin

strate empirically that following these inhalations the tenacious, viscid, mucopurulent contents of the bronchi and alveoli become liquified and less adherent to the walls of the respiratory tract

The significance of these effects cannot be appreciated unless one keeps in mind the potential danger and the actual damage caused by the accumulation of inflammatory products in the lungs. Stagnation of these products is harmful for several reasons: 1. Lack of their elimination leads to their delivery to the blood stream and thus to varying degrees of toxemia.

2. The presence of viscid mucus or mucopurulent plugs in the bronchi or bronchioles may cause massive or lobular atelectasis. These, in turn, are followed by sudden or slowly developing symptoms, such as dyspnea, thoracic pain, rise in temperature and cyanosis. I am of the opinion that the clinical entity known as autotuberculinization that is characterized by a rise of temperature and pulse rate, by general malaise and loss of appetite, is oftentimes the result of the development of varying degrees of atelectasis. Accordingly, the treatment of this symptom complex should be focused upon the elimination of atelectasis rather than upon the use of merely symptomatic measures. It is surprising how often these two conditions, massive and patchy atelectasis are overlooked by phthisiologists. In spite of the characteristic roentgenologic appearance they remain unnoticed or taken for tuberculous involvement of the lung parenchyma or the pleura.

3. The stagnation of purulent material on the walls of the respiratory tract is prone to cause ulceration, like tuberculous ulcers develop in the intestines in tuberculous patients who swallow their sputum and have an intestinal stagnation. Ulceration of the tracheobronchial tract may cause varying degrees of hemorrhage, weakening of the bronchial wall and consequent bronchiectasis, cicatrical stenosis, and, above all, an apparently unexplainable cough that is very difficult to control.

4. The retention and collection of mucus and pus weakens the ciliary action of the mucous membranes and thereby weakens the process of natural evacuation of the respiratory tract. By obliteration of the air pas-

sages the lungs become underinflated. Thus diminution of the ciliary function and underinflation of the lung represent a double handicap in the way of efficient cough. The lack of efficient cough favors the retention of mucopurulent inflammatory products thus completing a disastrous vicious circle.

The prevention of toxemia from absorption is of utmost importance. The attitude of neglecting adequate pulmonary drainage when marked wheezing, sybillant and sonorous rales, and wide-spread large moist rales are detectable may have serious consequences. The administration of opiates leads only to a protracted toxemia in such cases. The judicious use of carbon dioxide inhalations, on the other hand, is likely to induce adequate drainage from the lungs. This, in turn, not only obviates toxemia from absorption, but also may facilitate the closure of cavities, aid the approximation of ulcerated areas and promote the healing of lesions of the mucous membranes of the bronchi.

The seriousness of massive or patchy atelectasis resulting from obstruction of the air passages by inflammatory secretions lies not only in the symptoms induced by the development of atelectasis, but also in the potential predisposition of the atelectatic areas to the invasion of pathogenic microorganisms. Carbon dioxide inhalations should be given to patients who are prone to develop atelectasis. These include cases with auscultatory evidence of profuse formation of secretions that are not expectorated. In other instances the amount of bronchial secretions might be moderate, but their elimination is inadequate because the respiratory movements are restricted owing to thoracic pain, adhesions, or fear of hemorrhage. In cachectic patients the respirations may be incomplete and the intercostal muscles weakened so much that when the diaphragm descends during inspiration the lower thoracic wall is sucked in and thus the basal portions of the lungs remain underinflated or gradually arrive at a stage of atelectasis. A not infrequent camouflaged form of massive atelectasis is caused by bronchial spasm in the presence of retained secretions; it appears as a periodically recurring "spasmodic asthma."

The development of atelectasis results in a diminution of the respiratory surface and a

progressive anoxemia. Consequently, the respirations will increase automatically in an effort to supply the necessary oxygen. In this process carbon dioxide is washed out, causing a decreased alveolar carbon dioxide tension and a reduction of the alkali reserve. These changes lead to a deficiency of carbon dioxide in the blood and tissues.

Unproductive, severe cough disturbs the healing process, and its force may cause a spread of tuberculosis from one part of the lung to another, or from one lung to the other. It may favor the development of emphysema and spontaneous pneumothorax. It may cause a rupture of a pulmonary vessel and a consequent hemorrhage, also vomiting, loss of appetite, exhaustion, headache, insomnia, rise in temperature, dyspnea, cyanosis, thoracic pain, sub-conjunctival hemorrhage, or urinary incontinence. Unproductive cough is a trauma not only to the diseased lung, but to the entire body.

In carbon dioxide an ideal remedy is recommended for the treatment of cough. The apparatus used in my work consists of a tank that contains a mixture of 10 per cent carbon dioxide and 90 per cent oxygen, with an oxymeter which regulates the flow of gas per minute. A rubber tube connected to a glass tip, like that used for taking vital capacity, delivers the mixture to the patient. A rubber bag, which serves as a reservoir, is attached to the rubber tubing by means of a T-tube. The oxymeter is set for from 3 to 5 liters per minute, depending upon the individual reaction. The length of treatment should be from 15 to 30 minutes, and should be adapted to each patient. The treatments are repeated daily. In some instances when the elimination of the mucopurulent material is very difficult, two or three inhalations are given daily. There are cases in which the results by this simple procedure are not satisfactory. In such cases an ordinary mask, used for general anesthesia, is substituted for the glass tube and inhalations are given from 5 to 15 minutes at a time. The treatments are continued until satisfactory results are observed. Particular attention must be paid to the amount of sputum that is expectorated after carbon dioxide inhalation. If it appears that it is less than expected, postural drainage should be instituted after each treatment.

This combined procedure is indispensable in patients with general debility who are unable to carry through an effective cough.

The inhalations are followed, usually, by a noticeable increase in the depth of respiration. Immediate relief from a sensation of pressure and heaviness in the chest was observed in many instances. The alleviation of dyspnea is attributable to the elimination of bronchial obstruction partly by the liquefaction of tenacious, obliterating mucous collections. In patients with signs and symptoms of retention of mucopurulent material in the lungs, an unproductive cough can be changed into a productive one, and satisfactory pulmonary drainage established. Subsequent to inhalations the frequency and severity of cough are substantially reduced and the use of opiates for controlling it can be easily restricted or entirely eliminated. Full benefits of the treatment were noticeable in some of my patients only after the third or fourth day of the inhalations.

Complaints attributable to the inhalations occurred in few instances and were of minor significance. These were weakness, slight shaky feeling, hot sensation, frontal headache, palpitation and slight dizziness.

Indications of carbon dioxide inhalations
1 Excessive cough that is insufficient to induce good drainage
2 Dyspnea originating from lobar or multiple lobular atelectasis
3 Bronchiectasis secondary to pulmonary tuberculosis
4 When a surgical paralysis of the phrenic nerve is followed by an ineffective cough, and by retention of inflammatory products that may cause toxemia and dyspnea
5 Artificial pneumothorax, when the relaxation of the diseased lobe is accompanied by a massive atelectasis of the uninvolving lobe
6 Aiding the reexpansion of the lung following its collapse in connection with the drainage of an empyema, or the reexpansion of the lung after long-continued artificial pneumothorax
7 The prevention and treatment of massive atelectasis following thoracoplasty

The contraindications are
1 Hemorrhagic tendencies
2 Marked emphysema
3 Widespread pulmonary fibrosis without atelectasis and without mucopurulent retention in the air passages
4 Acute plastic pleurisy, and pleural effusion
5 Hypertension
6 When

the cause of cough or dyspnea is outside of the lung 7 Extreme debility

Conclusions

1 In cases of pulmonary tuberculosis where numerous moist rales or the presence of widespread rhonchi are indicative of the formation and retention of mucopurulent inflammatory products an adequate drainage of the lung is imperative

2 Accumulation and retention of viscid, tenacious secretions in the bronchial tract are likely to cause excessive cough and massive or patchy atelectasis

3 The inhalation of a mixture of carbon dioxide and oxygen is conducive to a liquefaction of bronchial secretions and to their efficient removal by means of the increased respiratory motion of the lung, by the blanching of the bronchial mucous membranes, and by the increased peristalsis of the bronchial tubes

4 The evacuation of the bronchial tract is likely to be followed by the opening up of previously atelectatic areas and consequently by the disappearance of dyspnea and cyanosis

5 The inhalation of a mixture of 10 per cent carbon dioxide and 90 per cent oxygen is recommended as a safe and efficient method for the treatment of dyspnea and atelectasis, and for the management of cough in pulmonary tuberculosis

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The Value of the Preventorium in the Health Campaign

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Boston, Massachusetts

DURING the past 3 to 4 years there have been frequent expressions of opinion by well-known authorities to the effect that the preventorium has outlived its usefulness if, indeed, it ever had any, that the "preventorium idea" is based on sentiment and not on sense, and, finally, that it is high time facts were faced and that the money now being spent—and the word, "wasted," might well be substituted—be devoted to other purposes. Papers on this subject have been read by Dr. Moorman of Oklahoma, at the meeting of the National Association two years ago, and by Dr. Chester A. Stewart at the last meeting in Milwaukee while opinions to this

effect have been openly expressed by other members of the Association, notably, Dr. A. J. Myers, and even more than hinted at by members of the National Tuberculosis Association staff. The reasons on which the opinion of these gentlemen is based appear to be somewhat as follows:

- 1) The preventorium type of child, namely, the infected contact case, appears to be not a danger to the community and therefore does not need to be institutionalized,
- 2) There is, in some communities at least, a lack of beds for children who are actively sick with tuberculosis and who are thus a menace to those about them and who are urgently in need of treatment,
- 3) The treatment that the child who is

* Deceased, July 20, 1938

merely infected, but not clinically sick is in need of, and apparently in some minds this type of child is not in need of very much, if any, treatment, can be perfectly well carried out in the homes or in so-called "foster homes",

4) Finally, no tangible facts or figures have been brought forward to show that the preventorium has accomplished anything as far as saving the lives and promoting the health of these children is concerned

I would state at the outset most emphatically that I am in distinct accord with the statement that the existence of a preventorium is not justified in any community where there are not sufficient beds for children who are sick with active communicable tuberculous disease. But as much as this unfortunate state of affairs holds true in Oklahoma and in Minnesota and in many other parts of this country, it does not hold true in many of the larger communities in the east. I certainly can speak for New England and feel that as far as the number of beds is concerned we have plenty in Massachusetts and very nearly all that are needed in the remaining five New England states to take care of all children who need institutional treatment and who without this would be a source of infection to others. I also feel quite properly, that the next step for us to take in order to reduce still further the ravages of this disease is to prevent the development of future cases of tuberculosis by taking care of these children as I believe they should be cared for, namely, in a preventorium and not to try to do this "in a half-baked way" in their homes

Let us consider the statement that this can all be done just as well in the homes. I am frankly amazed at this. It might just as well be said that children could be taught reading, writing and arithmetic and given what is the equivalent of the primary grades of school in their homes instead of sending them to school for this purpose. For the preventorium is nothing more or less than a school where children are taught kindly, but firmly and intensively the rules of right living, physically, mentally and indeed spiritually

There has been talk of so-called "foster homes" where these children can be taught and cared for. I do not believe that such a plan will ever prove successful in this country,

certainly not in our larger cities, particularly when it has been stipulated by one authority that these "foster homes" should be comparatively near at hand and not at a distance in the country

Exactly what is the situation in regard to the larger cities in the west and middle west regarding slum areas I do not know, but I can speak for New York, Philadelphia, Baltimore and Boston in only too certain terms on this subject. It is inconceivable for me to even imagine a "foster home" for children of the type that are accepted for our Prendergast Preventorium in the metropolitan Boston district that could in any way or shape give the care and training provided at our own institution. For after all, the work of the preventorium is primarily educational and not medical

I quite agree with those who say that no voluntary health or tuberculosis association such as ours should spend its money in maintaining an institution unless it were for educational purposes. While it is true that our children are given the proper food, diet, medical attention, x-rays and tuberculin tests, I look upon all this as comparatively unimportant details. What is of infinitely greater value is education along all lines. Not only do these children go to school and continue their regular course which they would have had at the public schools in Boston that they had been attending, but they are taught many other things, such as home hygiene, cooking, carpentry, gardening, the knowledge of flowers, birds and trees, the setting of tables and waiting at meals and everything that goes under the general category of the "amenities of life". I have had many meals at our preventorium with forty to one hundred children and never in my life have I ever seen a better behaved and a quieter and more courteous and kindly group of young folks than I have seen there. And this does not end the story by any manner of means. Sundays throughout the year and particularly in the summertime, parents in large numbers come to visit the children so that there may be 150 or more of them gathered at the preventorium grounds. For many of them this is the only holiday and vacation that they have during the year and they look forward to it immensely. On these occasions a talk or

demonstration of some kind of a practical nature is given by some well-qualified person while in addition children put on an entertainment of their own, greatly appreciated by friends and relatives Furthermore, the grounds are left clean and not cluttered with papers and litter while of greater import these Sunday meetings are not followed by upset stomachs on the part of the children on the following day

When the child enters our preventorium, and it is explained to the parents that this is simply a temporary transfer from one home to another, the home is visited by one of our workers and these visits are continued for an indefinite period after the child has been discharged from the preventorium By this means the child is not only kept under medical supervision, but it is seen to that the lessons learned at the institution in regard to fresh air, cleanliness, good food and rest are continued in the home and are taught to every member of the family

Education along even broader lines is carried Students from the three medical schools in this city come to Prendergast for demonstrations of the tuberculin reaction, x-ray and treatment of this type of case Nurses from practically all the nursing schools connected with our large Boston hospitals, social service workers and groups of women in almost every walk of life have meetings at our preventorium throughout the year Local medical societies more and more are including in their yearly program one meeting at our preventorium where doctors are given a practical demonstration of the diagnosis, treatment and training of the contact case

At the present time our sphere of influence is not merely confined to Boston Because we had a certain number of empty beds which our own finances did not permit us to fill, we are now taking "boarders," children from the towns and cities outside of Boston at no expense to us who otherwise would have no such treatment Dr Elliott Joslin of this city, an international authority on diabetes, was disturbed because he could find no place in this country where young diabetic boys could receive treatment and the course of training in proper food so necessary for their welfare, knowing that figures showed that these diabetic boys were thirteen times more liable

to tuberculosis than normal children We agreed to offer him a certain number of beds for these boys with the understanding that it would be at no extra expense to us During the past year we have had over one hundred of such diabetic boys who otherwise could not have received adequate care

It has been plainly stated by one of the critics of the preventorium that no facts or figures have been produced to show the preventorium is doing good and is doing anything more than could be done by medical and nursing supervision in the home or "foster home" A few years ago we looked up some 700 children who had attended our preventorium during the decade from 1922-1932 Some of the children in this group had thus been discharged ten years and some less than a year Of this group of 700, I found that only one child had since died of tuberculosis and that only three of these contact cases had since come down with clinical tuberculous disease We then investigated the exact condition of 700 children of the same age group, race, location as the others, each a contact case, with a positive tuberculin reaction, but who had *not* been able to attend our preventorium and who had remained at home under the care of the city tuberculosis nurses and physicians and in a few instances of their own private doctors Dr Cleaveland Floyd of this city, Director of the Tuberculosis Clinics, provided this list of children with the understanding that they were to be similar in every way as far as was possible to the first group Of these children who had been handled during the same decade, 1922-1932, it was discovered that *ten* had since died of tuberculosis and that 40 had since come down with clinical tuberculous disease Granted that figures are not always reliable, it certainly would appear from this that the striking balance as far as results are concerned in favor of those children who *had* been given preventorium training could not be and was not entirely due to chance These figures which have been published and concerning which I spoke at the meeting of the National Tuberculosis Association at Saranac Lake three years ago have as yet to be refuted They are striking evidence of the value of a well-run preventorium

To summarize this moot subject I would

state

- 1) That I believe the preventorium is justified only in those communities where there are ample bed facilities for clinically sick children
- 2) That the preventorium is an educational institution of the very greatest importance and the widest scope, affecting not only the children themselves but the parents and other members of the family
- 3) That as far as Boston and other large

cities are concerned, "foster homes," no matter how excellent, cannot possibly provide the kindly care, skilled attention and detailed and personal after-care that can be offered by a well-run preventorium

- 4) That the figures which I have here shown concerning our own Prendergast children show definitely and clearly what a well-run preventorium such as ours can do and that its existence is distinctly more than justified

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Tuberculous Enteritis*

JAMES J. GORMAN, M.D.
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WE ARE called in consultation, the patient is male, aged 26, his skin, pale, almost waxy, marked emaciation, even to gauntness, mental depression with a dejected expression, and eyes sunken, surrounded by dark circles. All in all he presents a toxic appearance. Only a few moments are required to elicit a history of pulmonary tuberculosis of two and one-half years' duration, and gastro-intestinal symptoms for a period of six months, consisting of variable abdominal pain, nausea, vomiting, and diarrhea to the extent of six to ten soft, mushy and occasional liquid movements, greenish in color, with a rancid odor, containing both mucus and blood.

The picture you have just visualized is a history of far-advanced pulmonary tuberculosis with tuberculous enteritis. The prognosis is hopeless—beyond the scope of medical science. Treatment is of no avail. The only alternative is to alleviate suffering and to resort to opiates. This case was seen in 1926, as were many others of a similar nature. Fortunately, they are now becoming less frequent and, may we even say, of only rare occurrence.

We now more frequently see another picture. This time the patient is a female, aged 45, with a history of pulmonary tuberculosis for a period of four years. There is also a history of vague digestive symptoms for a period

of some twenty years, but not of sufficient importance to suggest treatment until six weeks before examination. Symptoms appeared following an acute respiratory infection. The presenting symptoms were regurgitation and vomiting, occurring immediately to two hours after meals. The bowels were ordinarily constipated, but at the time of examination were normal. No pain or cramping was present, however nervousness was quite evident. She had been examined elsewhere one year previous and told that she did not have tuberculous intestinal involvement.

The examination showed a pulse rate of 110. There was slight tenderness over the right lower portion of the abdomen. The sigmoid was palpable as a firm contracted tube. The cecum was palpable as a firm, resistant, and tender mass. There was a mid-line scar from appendectomy. The stool was very offensive, yellow in color, and microscopic examination showed numerous starch granules. A clinical diagnosis of tuberculosis of the cecum was made and this was confirmed by x-ray examination.

The stomach showed moderate atony, ptosis, and emptied rather slowly, though it was completely empty at the end of six hours. The duodenal cap was normal as to motility, slightly enlarged. Six hours after taking the barium the terminal ileum was distended at the ileo-cecal valve. The cecum was not freely movable. Twenty-four hours

* Presented at the Twenty-ninth Annual Meeting of the Texas Tuberculosis Association, El Paso, Texas April 16, 1938

after taking the meal the entire colon was empty Enema injection showed the haustral markings practically absent throughout the descending and left half of the transverse colon The cecum, ascending, and right half of the transverse colon showed marked irritability and failed to retain the barium The ileo-cecal valve was forced easily and the terminal ileum remained filled This examination revealed definite evidence of inflammatory reaction of both the cecum, ascending, and right half of the transverse colon Appropriate treatment was instituted

Though it was considered by Doctor Homan, who was directing the pulmonary treatment, that the chest condition was satisfactory, she continued to have a temperature of 100 to 100.5, but this gradually became normal and she began to show a slow, but very steady increase in weight Three months later her temperature was normal, her pulse was 92, and there was a gain in weight of seven pounds Six months later she had gained twelve pounds and was free of symptoms, except for occasional, very slight, gas There was no longer any abdominal tenderness

She was kept under x-ray observation, which, repeated eighteen months after the original examination, showed the cecum and one-half of the ascending colon to have a fixed and rigid wall devoid of hastrations However, there was no irritability or tenderness

The outline of the cecum did not change on manipulation The ileo-cecal valve was open, but did not show the irritability noted on the original examination At that time she was entirely free of symptoms There was no tenderness of the abdomen, she had gained a total of twenty pounds, her bowels were moving normally, and her general condition was excellent Some six months later she returned to her home and continued to take part in her former activities, observing moderate precautions such as daily rest, and only reasonable dietary restrictions

Unfortunately, six years later she developed pneumonia followed by empyema which resulted fatally There did not seem to be any relation between the acute condition and her former tuberculous involvement

Between these two cases we have many others showing multiple symptoms and like-

wise variable periods of onset of gastro-intestinal symptoms following the development of pulmonary pathology and other complications in particular tuberculous laryngitis

Case no 3 This is again a female, aged 26, and is typical of various symptoms and their progression as noted in this group The patient was examined in July, 1931, and gave a history of tuberculosis since 1925 which, however, had become inactive She had remained well until January, 1931 when, following an attack of flu at this time, she developed gastro-intestinal symptoms with the presenting symptom that of nausea Gastro-intestinal symptoms most commonly are noted one to four years after the development of pulmonary pathology The presenting symptom in this case of nausea is one of the four most common symptoms, the others are vomiting, pain, and diarrhea

At the time of examination, she stated that nausea was present most of the time, especially on movement of the body and showed no relationship to meals She had a desire to vomit, but did not actually do so Gas was present at times and there was occasional rumbling, but no distention Pain was usually present once daily and was not sharp Occasional belching associated with regurgitation of sour material Her bowels had been constipated for several years requiring cathartics The movements were yellow in color and contained considerable mucus Several foods seemed to disagree, in particular citrus fruits

She was very nervous, high strung, irritable, and slept poorly She seemed to be awakened by a rise in temperature in the early morning Numbness of the feet was present The abdomen showed moderate distention, was hyperresonant, and the sigmoid was palpable

X-ray examination confirmed the clinical diagnosis of tuberculous involvement of the intestines and treatment was instituted She was very toxic due to her chest condition and was taking pneumothorax, the response, however, being very poor Her discomfort was aggravated by severe pleurisy

The nausea was entirely relieved in two weeks as well as the other symptoms and, except for the pleurisy, she was feeling very much better Laryngeal involvement which

had been present for four months became worse six weeks after my examination and the laryngologist cauterized the throat at this time. It was necessary to make a variation in her diet because of soreness of the throat.

In about three months she stated that her bowels were moving two or three times daily without cathartics and that the last movement was usually loose. This is always a symptom of extreme importance. Normal movements occurring after a history of marked constipation are always significant and suggest future development of diarrhea, which occurred in this case three months later.

Her digestion, however, had been markedly improved and she was able to increase her diet to a very generous extent. Except for occasional nausea, symptoms were no longer present. However, her general condition was failing and her temperature was varying between 99.6 and 103. Her throat was not responding satisfactorily and her chest condition was growing steadily worse.

After seven months diarrhea was present constantly and she was having three or four movements daily. She had developed pain over the entire abdomen with considerable rumbling and variable distention. Nausea was present frequently and she vomited not infrequently. The bowel movement continued to be a yellow color. The abdomen was now full and distended, with moderate degree of tenseness and tenderness over the lower portion. By this time her lung condition had become very much worse.

The future course was inevitable. In this case we have practically a complete summary of the ordinary gastro-intestinal symptoms encountered in far-advanced tuberculous enteritis. Again we see the dangers of reactivation of the pulmonary lesion and the poor prognosis when the picture is further complicated by laryngeal involvement.

It should be evident, at this time, that the symptoms of intestinal tuberculosis are not constant, in fact are highly variable, and that there is no one symptom or group of symptoms that in itself is indicative of this complication. The four symptoms, nausea, vomiting, pain, and diarrhea, in a case of known pulmonary involvement are always suspicious of intestinal involvement and this condition

should be excluded regardless of the apparent severity or minor characteristics of these symptoms. Another important feature is the presence of temperature, even though of low grade, in a case in which it cannot be explained on the basis of pulmonary involvement. A sudden loss of weight or development of anemia not explainable by an increase in the pulmonary lesion should be a hint to intestinal investigation in spite of the absence of symptoms referable to this organ. In the majority of cases, the presence of intestinal involvement bespeaks cavity formation of the lungs, but this is not necessarily true, and vague abdominal symptoms in a patient with even minimal pulmonary involvement, whether it be active or healed, should suggest investigation for possible intestinal pathology.

Intestinal involvement is most frequently found in the order mentioned: the cecum, ileum, ascending colon, and transverse colon. Involvement of the ileo-cecal region, appendix, jejunum, rectum, sigmoid and duodenum, is of a lesser extent and the frequency varies in different series of cases.

Intestinal symptoms in a case of known tuberculosis must not be considered due necessarily to tuberculous complications, for other conditions may be present. After all, the findings as described on x-ray examination are those of ulceration, which may be non-tuberculous, as in the following case.

Case No 4 Here we have a female, aged 32, who had a moderately advanced pulmonary condition with a history of nausea and severe diarrhea. X-ray examination showed marked ulceration of the cecum, ascending colon, right one-half of the transverse and, to a less extent, of the descending colon. The findings were out of proportion to what would be expected from tuberculous involvement. Stool examination revealed a high grade amoebic infestation. Treatment aimed at this condition gave immediate relief of intestinal symptoms.

Tuberculous intestinal involvement in childhood probably presents a near silent picture more often than in adults, as in *Case No 5*. The age here was 9, the case being referred to me by the chest specialist who was taking care of the child's father.

He had not previously been examined. The

presenting symptoms were constipation and a blotchy appearance of the skin of the face and neck on exertion. Further questioning revealed occasional temperature of about 99.6. He occasionally vomited and had slight pain, and gas was present infrequently. When present, the pain appeared immediately after meals. There was slight tenderness over the right lower quadrant.

The lung examination showed suggestive evidence of adult pulmonary tuberculosis. Gastro-intestinal x-ray examination showed slight irritability of the cecum, and the chest consultant confirmed the presence of active pulmonary tuberculosis. Appropriate treatment resulted in complete cure.

Reliable statistics of post mortem examinations reveal that a percentage varying between 15 and 25 per cent, showed intestinal tuberculous involvement. These had not had any clinical symptoms during life.

Post mortem examinations further reveal completely healed and varying stages of healing of intestinal ulceration in cases coming to their death solely from tuberculous involvement.

To avoid an extra load for the tuberculous patient, it is essential that we accord the greatest importance to even the slightest of digestive symptoms, for severe intestinal complications can often be avoided by proper investigation in early stages. Again, it is possible to assist a patient in shortening his period of invalidism by attention to non-tuberculous conditions as shown in the next case.

Case No 6 This was a female, age 26, with gastro-intestinal symptoms and tenderness over the right lower quadrant. Tuberculous involvement was excluded by the x-ray examination, but indications of appendicitis, which of course, could not be said to be non-tuberculous were present.

She was operated on by Dr F P Miller, who removed a subacute appendix which the pathologist reported to be non-tuberculous. The digestive symptoms showed immediate improvement and disappeared within six weeks after operation. A very slow convalescence from the pulmonary involvement now became much more rapid and, probably in much quicker time than if operation had been deferred, the patient became free of pulmonary activity.

The diet in these cases need not be complicated. A smooth non-irritating diet, containing sufficient calories, but not overburdening a toxic patient with a too high caloric content, sufficient protein to meet the daily requirements, and a high vitamin content is indicated. If citrus fruits are poorly tolerated, vitamin C preparations are available. All vitamins, A and D and, in particular, vitamin B are valuable adjuncts. The use of heliotherapy and medication will depend on the patient as well as on the attending physician's personal evaluation of their benefit.

In conclusion the successful treatment of intestinal tuberculosis depends primarily on early diagnosis, thorough treatment, and absolute cooperation with the chest consultant.

NOTICE OF MEETING

The American Public Health Association will hold its 67th Annual Meeting in Kansas City, Missouri, October 25 to 28.

The program comprises fifty morning and afternoon meetings arranged by the ten Sections of the Association which are Health Officers, Laboratory, Vital Statistics, Public Health Engineering, Industrial Hygiene, Food and Nutrition, Child Hygiene, Public Health Education, Public Health Nursing, and Epi-

demiology.

More than 300 papers and committee reports will be presented during the four day meeting.

A few of the well-known names on the program are as follows: Dr Haven Emerson, Surgeon-General Thomas Parran, Dr Earle G. Brown, Colonel A. Parker Hitchens, Dr Karl F. Meyer, Dr William A. Sawyer, and Professor C. E. A. Winslow.

PNEUMOPERITONEUM* — An Adjunct to the Treatment of Pulmonary Tuberculosis

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PNEUMOPERITONEUM, as such, is not a novelty. Since 1902, it has been used frequently for diagnostic purposes and since about 1917 it has been utilized in the treatment of intestinal and peritoneal tuberculosis. It is a form of collapse therapy applicable in selected cases of pulmonary tuberculosis, lung abscess and extensive bronchiectasis. The present discussion, based on a review of the literature and a series of 19 cases now receiving pneumoperitoneum, will be confined to its uses in pulmonary tuberculosis.

Literature

In the first report on this subject, published in the *American Journal of the Medical Sciences* in 1931, Dr. Andrew S. Banyai¹ said:

"It is conceivable that the elevation of the diaphragm, attained by pneumoperitoneum treatment, may exert a favorable influence upon the healing of the pulmonary process by limiting the excursions of the diaphragm and by decreasing the intrapleural negative pressure, which, in turn, will increase the blood supply of the pulmonary tissue."

After several years experience with the method, Dr. Banyai stated:

"The two most important immediate results of artificial pneumoperitoneum are (1) the drainage of inflammatory products from cavities and from the bronchial tract (increased expectoration without increased cough), and (2) a relative functional rest of the diseased lung."

He was of the opinion that these two factors with the accompanying passive congestion and lymph stasis subsequent to pulmonary relaxation contribute substantially to the elimination of the tuberculous process both by absorption and by fibrous tissue formation.

Not until 1934 does there occur any further mention of this subject in the literature. Then

Dr. Banyai, in the *American Review of Tuberculosis*, advocated combining pneumoperitoneum with phrenic nerve block.² This combination remains the most effective manner in which this method of collapse can be used.

In 1937 a study of a series of cases so treated by Drs. H. C. Trimble and B. H. Wardrip appeared in the *Transactions of the Thirty-third Annual Meeting of the National Tuberculosis Association*.³ This new form of therapy is now being used by these men and Doctor Edward W. Hayes^{4 5 6} in California, by Dr. Minas Joannides in Chicago, by Dr. Banyai¹ in Wauwatosa, Wisconsin, by Dr. William Devitt in Allenwood, Pa., by Dr. Frank Walton Burge⁷ in Philadelphia, Pa., and here in Atlanta.

Doctor E. W. Hayes⁴ in 1924 reported the treatment of intestinal and peritoneal tuberculosis with intraperitoneal injections of oxygen and supplied an excellent bibliography of pneumoperitoneum to that date. In later reports^{5 6} he reported additional cases treated with oxyperitoneum.

Indications for Artificial Pneumoperitoneum

The indications for artificial pneumoperitoneum in the treatment of pulmonary tuberculosis are as follows:

"1 If artificial pneumothorax is indicated, but cannot be established. In unilateral cases better mechanical results can be obtained by the combination of this method with phrenic nerve block.

"2 Severe pulmonary hemorrhage that cannot be controlled by any other means.

"3 Following pregnancy in cases of pulmonary tuberculosis in which pneumothorax cannot be induced.

"4 If after pneumothorax has been discontinued the tuberculous process becomes reactivated, but pneumothorax cannot be re-established.

"5 In addition to phrenic nerve block in which the elevation of the diaphragm is insufficient.

"6 In addition to mechanically satisfactory phrenic nerve block when the sputum remains

* Read before the Fulton County Medical Society, January 20, 1938.

persistently positive

"7 If the tuberculous lesion is too extensive for a bilateral artificial pneumothorax

"8 Bilateral pulmonary tuberculosis complicated by intestinal or peritoneal tuberculous lesions

"9 Pulmonary tuberculosis complicated by basal bronchiectasis

"10 Marked basal emphysema complicating pulmonary tuberculosis

"11 In addition to artificial pneumothorax in which the relaxation of the basal portion of the pneumothorax lung is desirable, but cannot be accomplished by pneumothorax alone, because of adhesions

"12 Allergic bronchial asthma complicating pulmonary tuberculosis"

From the foregoing it is apparent that this type of collapse therapy is especially adapted to those cases having extensive bilateral involvement or in which pneumoperitoneum is used to supplement some other method or methods of collapse. As yet this method does not compete with or supplant more orthodox means of inducing collapse—provided satisfactory results are thereby obtained.

*Knowledge of Pneumothorax Therapy
Helpful*

Those who begin the use of pneumoperitoneum will find that previous experience with pneumothorax therapy is of great help. Otherwise the road to perfect technic and success is fraught with many pitfalls for the conscientious physician. There are many red, yellow and green signals which cannot be adequately described on paper, but can be distinguished only by the educated touch of an experienced finger.

Necessary Equipment

The essential equipment for the administration of pneumoperitoneum is A pneumothorax apparatus, 4 cc of 2 per cent solution of "Novocaine," a 5 cc syringe with one 24 gauge needle 1½ inches in length for the "Novocaine" infiltration, and a 19 gauge needle 1½ inches in length for introduction of air. The latter needle should have the bevelled point filed shorter to make it slightly blunt, thereby reducing the danger of visceral puncture.

Treatment

For the treatment, the patient is placed in one of two positions determined by the point of entrance. For the subphrenic introduction of air the patient is placed in the lateral position, as in pneumothorax, and for the upper and lower introduction of air the patient is placed in a semi-reclining position. In the latter position the points of entrance (upper and lower) are located at the left lateral border of the rectus muscle—either just under the costal margin, or three inches below the umbilicus. Neither of these points of entrance offers any advantage in any respect except that of choice to the operator.

After selection of the point of entry the skin is sterilized with iodine or alcohol and both skin and abdominal wall are infiltrated with about 4 cc of "Novocaine" solution. No attempt is made to infiltrate the peritoneum. The larger needle is now introduced at a slight angle, thus avoiding direct pressure on the viscera, and the tube from the pneumothorax apparatus is attached. Unless there is an already well-established pneumoperitoneum, the manometer of the pneumothorax apparatus will not register when the needle is first introduced. Due to the lack of pressure fluctuation and the constant presence of positive pressure, the manometer is of very little value in this type of injection.

The manometer may reveal the positive pressure in the abdomen following the injection of 200 to 600 cc of air. At the first, an injection of 200 cc of air is usually given. Succeeding injections are increased by increments of 200 cc until 800 to 1500 cc are given.

As in pneumothorax therapy, the interval of injection depends upon the rate of absorption, a four-day interval being necessary for the first three to six injections. When the pneumoperitoneum has been well established, the interval may be increased to seven days.

It is the part of wisdom to explain all details of the procedure to the patient so that he may be in a receptive frame of mind, thereby avoiding reactions from fear or nervousness. During the flow of air into the abdomen the patient is questioned regarding any sensation of pain or pulling in the chest. Usually 100 to 200 cc of air may be injected following

the start of discomfort If the pain is acute, lowering the patient's head and placing a pillow under the hips will afford relief by allowing the air to accumulate in the pelvis

Discussion of Effects and Results

There are few, if any, hazards attendant upon entering the abdominal cavity It is an old procedure The most serious accident is the formation of air emboli—and these are rare indeed Fluid may occur infrequently, but is of little consequence Obliteration of the peritoneal space may occur in a few instances, but the reports contain no mention of any discomfort Clinically, pneumoperitoneum produces no ill-effects and, to date, no clinical evidence of intestinal obstruction or adhesions has been developed following cessation of treatment This is so despite a report from Dr Gertrude Moore, of Los Angeles³, that at autopsy patients have shown a picture of intense chronic peritoneal inflammation Reports of the examination of the peritoneum during life, as observed at operation, are lacking in the literature, and I have had no occasion to have any of the patients in my series operated on

There are many favorable symptomatic results in successful pneumoperitoneum Relief of insomnia, increase of appetite, decreased sputum, lessened cough and abdominal symptoms The psychic effect upon the patient is remarkable, especially in advanced cases

Unlike pneumothorax, the air is absorbed

from the abdomen very quickly As a result, patients must be watched closely so that refills may be sufficiently close together to keep the diaphragm continuously elevated This can be done in sanatoria or private practice only where examinations can be made when necessary

As in all new forms of therapy, a large number of cases must be studied, under all conditions, and followed for a number of years before positive statements can be made as to the merits and facts of the treatment Statistical data do not yet permit a sufficient study of pneumoperitoneum, but its usefulness in selected cases has been proven, even in the short time it has been utilized Its continued use with careful observation is strongly advocated

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- 4 Hayes E W, *A Preliminary Report on the Treatment of Tuberculous Conditions of the Abdomen by Means of Oxyperitoneum and Pneumoperitoneum* (Lancet, Nov 15, 1924)
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NOTICE OF MEETING

The Association of Military Surgeons of the United States has chosen the Mayo Foundation at Rochester, Minnesota as their meeting place during October 14, 15, and 16, 1938

In addition to the regular members of the Association of Military Surgeons of the United States, the Association of Medico-Military Inactive Duty Training Unit will meet there

at the same time This unit is composed of several hundred medical officers, active and reserve, of the Army, Navy, Public Health Service, National Guard, and Veterans' Administration

An interesting program has been arranged by the Committee and the trip to the Mayo Clinic should be well worthwhile

The Report of the Sanatorium Committee of the American College of Chest Physicians*

DURING a period of six months, from August, 1937 to January, 1938 inclusive, questionnaires were mailed from the offices of the American College of Chest Physicians to private sanatoria in the United States. Four questions were asked (Table I). The interesting highlights of this report are

1 That for a period of five months the number of beds occupied and vacant in the private sanatoria of this country remained almost stationary, but in January, 1938, the number of beds occupied rose to 87.8 per cent and the number of beds vacant decreased to 12.2 per cent. Also, the number of patients on the waiting lists increased in these institutions in January, 1938.

2 That the number of patients who paid full rates remained stationary during a period of five months and that in January, 1938 this also increased to 60.8 per cent as compared with a low of 53.3 per cent in October, 1937. In keeping with the general run of the report, the number of patients treated free also decreased in January, 1938, to 22.1 per cent from a high of 23.2 per cent in August and December, 1937.

3 That the number of patients who were receiving pneumothorax showed a decline in January, 1938, of almost 7 per cent from August, 1937. Those receiving thoracoplasty also showed a decline from a high of 31 per cent in November, 1937, to 15 per cent in January, 1938. Phrenics showed a low of 6.4 per cent in December, 1937, compared to a high of 9.4 per cent in January.

In comparing this report with the survey made last year by the Statistical Committee of the Federation of American Sanatoria, which was reported by Dr. E. W. Hayes, Chairman of this Committee at our meeting last year at Atlantic City, we found that 475 public sanatoria having a total number of 53,597 beds, with an average of 164 beds in

each sanatorium reported, as compared with 56 private sanatoria reporting a total of 3,508 beds or an average of 63 beds in each sanatoria.

The average number of vacancies in public institutions was 12, compared with the average vacancies in private institutions of 15.

Public institutions reported an average of 29 patients on the waiting list, compared with an average of 2 in the private sanatoria.

Approximately 12 per cent of the beds in public institutions were vacant as reported in last year's survey as compared with 25 per cent of the beds vacant in private sanatoria as reported in this survey.

In a survey made in 1935 of available beds in private sanatoria, reported by Dr. E. W. Hayes in his paper published in *Diseases of the Chest*, October, 1937, the conclusions were that out of 3,348 beds in the private sanatoria, 1,182, or a little over one-third of the total number were reported as vacant. The report this year shows that there are fewer vacant beds in private sanatoria during the period of this survey as compared with the survey made in 1935.

In the report of the Statistical Committee rendered at Atlantic City last year, figures showed that 29 per cent of the patients in public institutions were receiving pneumothorax, 11 per cent had received phrenic paralysis, and 4.38 per cent had received thoracoplasty. This present report shows that 29.4 per cent of the patients in private institutions were receiving pneumothorax, 7 per cent had received phrenic paralysis, and 2.7 per cent had received thoracoplasty.

Deductions

Pneumothorax in private and public institutions were on a par, phrenic paralysis showed 4 per cent more in the public institutions, and thoracoplasty 1.5 per cent more in public institutions.

The per diem cost in the private sanatoria, as reported by 38 institutions, showed a low of \$1.00 and a high of \$7.31, or an average of

* Read before the Fourth Annual Meeting of the American College of Chest Physicians, San Francisco California June 12, 1938

DISEASES OF THE CHEST

SEPTEMBER

\$3 11 This is compared with the report on the public institutions showing a per diem cost of operating ranging from 70c low to \$5 48 high, or an average of \$2 36 These figures do not include the per diem costs in Federal Hospitals where the per diem costs are higher than those in other public institutions

The report further shows that in the 56 private institutions, 57 9 per cent paid full rate, 20 8 per cent paid part rate, and 21 3 per cent were treated free of charge

Pneumothorax Patients	423	35 8
Thoracoplasty Patients	32	2 7
Phrenic Patients	106	8 9
Total Reported Cost	15	
a) highest		\$4 50
b) lowest		\$1 33
c) average		\$3 77

TABLE III

September, 1937

TABLE I

Questionnaire Data

1 Accomodations

- a Number of beds available for tuberculous patients
- b Number of beds occupied
- c Number of beds vacant
- d Number of patients on waiting lists

2 Rates

- a Number of patients paying full rate
- b Number of patients paying part rate
- c Number of patients treated free

3 Collapse treatment

- a Number of patients receiving pneumothorax
- b Number of patients receiving thoracoplasty
- c Number of patients receiving phrenic

4 Cost

Per diem cost per patient

	No	Per Cent	Cost
Total Reported	56		
Total Beds	3508		
a) occupied	2704	77 1	
b) vacant	804	22 9	
Waiting List	109		
Full Rate Patients	1341	57 9	
Part Rate Patients	482	20 8	
Free Patients	493	21 3	
Pneumothorax Patients	796	29 4	
Thoracoplasty Patients	75	2 7	
Phrenic Patients	190	7	
Total Reported Cost	38		
a) highest		\$7 31	
b) lowest		\$1 00	
c) average		\$3 11	

TABLE IV

October, 1937

TABLE II

August, 1937

	No	Per Cent	Cost
United States			
tion at Reported	27		
ing place du	1518		
In addition	1180	77 7	
Association of I	338	22 3	
States, the Ass	46		
Inactive Duty Tr	587	54 7	
s	238	22 1	
	249	23 2	

	No	Per Cent	Cost
Total Reported	50		
Total Beds	3194		
a) occupied	2405	75 3	
b) vacant	789	24 7	
Waiting List	221		
Full Rate Patients	1148	53 3	
Part Rate Patients	527	24 4	
Free Patients	482	22 3	
Pneumothorax Patients	923	38 3	
Thoracoplasty Patients	74	3	
Phrenic Patients	157	6 5	
Total Reported Cost	31		
a) highest		\$7 26	
b) lowest		\$1 62	
c) average		\$3 15	

DISEASES OF THE CHEST

TABLE V

November, 1937

	No	Per Cent	Cost
Total Reported	40		
Total Beds	2335		
a) occupied	1740	74.5	
b) vacant	595	25.5	
Waiting List	76		
Full Rate Patients	936	54.2	
Part Rate Patients	481	27.9	
Free Patients	309	17.9	
Pneumothorax Patients	538	30.9	
Thoracoplasty Patients	55	3.1	
Phrenic Patients	119	6.8	
Total Reported Cost	28		
a) highest		\$6.37	
b) lowest		\$1.65	
c) average		\$3.19	

TABLE VI

December, 1937

	No	Per Cent	Cost
Total Reported	37		
Total Beds	2662		
a) occupied	2094	78.7	
b) vacant	568	21.3	
Waiting List	61		
Full Rate Patients	1161	54	

TABLE VI (Continued)

Part Rate Patients	490	22.8
Free Patients	499	23.2
Pneumothorax Patients	740	35.3
Thoracoplasty Patients	36	1.7
Phrenic Patients	135	6.4
Total Reported Cost	25	
a) highest		\$5.62
b) lowest		\$1.70
c) average		\$3.15

TABLE VII

January, 1938

	No	Per Cent	Cost
Total Reported	28		
Total Beds	1955		
a) occupied	1718	87.8	
b) vacant	237	12.2	
Waiting List	158		
Full Rate Patients	864	60.8	
Part Rate Patients	243	17.1	
Free Patients	314	22.1	
Pneumothorax Patients	490	28.5	
Thoracoplasty Patients	26	1.5	
Phrenic Patients	163	9.4	
Total Reported Cost	18		
a) highest		\$5.61	
b) lowest		\$1.30	
c) average		\$3.06	

SANATORIUM COMMITTEE

Louis Mark, M.D., Columbus, Ohio,
ChairmanBenjamin A. Shephard, M.D., Oshtemo, Mich.,
Vice-ChairmanAlexius M. Foster, M.D., Cragmor, Colorado,
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George T. Palmer, M.D., Springfield, Illinois,
Ralph B. Scheier, M.D., San Francisco, Calif.,Frederick A. Slyfield, M.D., Seattle, Wash., **
Everett E. Watson, M.D., Salem, Virginia*In the absence of Dr. Louis Mark, Columbus, Ohio,
Chairman of the Sanatorium Committee the report
was read by Dr. Frederick A. Slyfield, Seattle, Wash-
ington, member of the Sanatorium Committee

POSITION AVAILABLE

Positions are available for single resident physicians in tuberculosis sanatoria. Must
be graduates of accredited medical schools and have had some training in tuberculosis.
Please mail full particulars to DISEASES OF THE CHEST, P O Box 1069, El Paso, Texas

An Appetite and Weight-Building Tonic in Chronic Pulmonary Tuberculosis*

A Study of Ninety-Eight Cases

HENRY W LEETCH, M.D., and JOHN N HAYES, M.D., F.A.C.P.

SARANAC LAKE, NEW YORK

IN ANY chronic infection such as pulmonary tuberculosis, stimulation of appetite sooner or later becomes an important factor in the treatment, so much so that the phthisio-therapist is always on the alert for agents to accomplish this. Anything that will break the familiar circle of toxemia, loss of appetite, and loss of weight is of tremendous value in turning the tide in favor of the tuberculous individual.

Following the report of Ornstein and Epstein¹ on the use of a new vegetable compound in 301 cases of pulmonary tuberculosis, the authors became interested in this preparation and tried it on ninety-eight patients in the Endicott-Johnson Sanatorium in Saranac Lake, Gabriels Sanatorium, and on private patients.

The vegetable compound^{**} is an alcoholic extract of garlic, cypress, eucalyptus, creosote,

and menthol and is administered on a small piece of bread which is held in the mouth a few moments while the fumes are inhaled and then the bread is swallowed. Three drops twenty minutes before meals are given the first day, and the daily dose increased by one drop until thirty drops three times a day are given. This dosage is continued for as long as seems desirable. None of our patients took the treatment for less than six weeks, and

TABLE II

Moderately Advanced (31 patients)

	No	%
I Gained weight	17	
(a) Continued to gain	4	
(b) Previously lost and then gained	0	
(c) No previous weight record	3	
(d) Stationary and then gained	10	
II Lost weight	6	
(a) Gained before treatment and then lost	1	
(b) Continued to lose	1	
(c) Stationary and then lost	4	
(d) No previous record	0	
III Stationary in weight	8	
(a) Gained before and then stationary	1	
(b) Lost before and then stationary	0	
(c) Remained stationary	7	

TABLE I

Moderately Advanced (33 patients)

	No	%
Gained weight	17	54.8
Lost weight	6	19.4
Stationary	8	25.8
Discontinued from upset stomach	2	
Average gain in weight	12.9 lbs	
Average loss in weight	6.0 lbs	

Far Advanced (65 patients)

	No	%
Gained weight	25	41
Lost weight	19	31
Stationary	17	28
Discontinued from upset stomach	4	
Average gain in weight	8.3 lbs	
Average loss in weight	6.4 lbs	

These cases were then analyzed as shown in Table II

Far Advanced (61 patients)

	No	%
I Gained weight	25	
(a) Continued to gain	6	
(b) Previously lost and then gained	6	
(c) No previous weight record	2	
(d) Stationary and then gained	11	
II Lost Weight	19	
(a) Gained before treatment and then lost	1	
(b) Continued to lose	13	
(c) Stationary and then lost	5	
(d) No previous record	0	
III Stationary in weight	17	
(a) Gained before and then stationary	0	
(b) Lost before and then stationary	1	
(c) Remained stationary	16	

* Reprinted from New York State Journal of Medicine, August, 1938, Volume XXXVIII, Number 15

**We are indebted to the Salus Lab., Inc of New York, for keeping us supplied with this material known as Gamacor, which made it possible for us to conduct this investigation

TABLE III
Monthly Medlar Index Computed

<i>Moderately Advanced (16 patients)</i>		<i>Gained</i>	<i>Lost</i>	<i>Stationary</i>
Index above 25 (definitely toxic) who remained above 25	4	1	2	1
Index above 25 who fell below 25	1	1	0	0
Index below 25 who remained below 25	10	7	3	0
Index below 25 who rose above 25	1	0	1	0
<hr/>				
<i>Far Advanced (8 patients)</i>				
Index above 25 who remained above 25	5	1	3	1
Index above 25 who fell below 25	3	2	1	0

most for from two to six months. A few patients objected to the rather strong odor and taste, or were upset by it. In these cases, administration in water instead of on bread or sugar overcame the objection.

We first tried the preparation on a few patients and the results were so striking that we gave the treatment to as many as would accept it.

The results on all of our cases, divided into moderately advanced and far advanced, are shown in Table I-II.

Some of the gains and some of the losses cannot be wholly attributed to the good effect or lack of benefit of the treatment. For example, one patient who lost weight under this treatment lost three members of his family and as a consequence sustained a severe upset. Ten cases who lost weight were terminal cases. A patient who gained thirty pounds was given the preparation at the beginning of the cure, with no previous record.

Attention should be drawn to the twenty-seven of the ninety-one patients who were either losing weight or stationary and who gained.

It will be seen that a larger percentage of the moderately advanced patients gained weight than did the far advanced cases. This, of course, is to be expected. On all these patients the routine treatment for pulmonary

TABLE IV
Erythrocyte Counts

Improved count	15 or 79%
Average gain	1,000,000
Stationary	4 or 21%

tuberculosis was continued. Where surgical intervention was indicated, it was used.

Thirteen patients had improved appetite without a gain in weight. Of these the weight remained stationary in seven and was reduced in six.

On twenty-four patients leukocyte counts were done every month and the results tabulated according to the Medlar index (Table III).

From this it will be seen that the weight curve rather closely follows the blood picture as charted by the Medlar evaluation. It is not suggested that the administration of this compound had any influence on the toxemia of these patients as reflected in the blood stream.

It is of interest to note that in those patients with a low Medlar index the percentage of weight gain was greatest. This, of course, is to be expected. It is also interesting to see the gain in weight in even a small percentage of those patients whose blood picture remained bad throughout the treatment.

In a total of nineteen patients total erythrocytic counts were done before the treatment was started and at monthly intervals thereafter (Table IV).

Summary

This compound (alcoholic extracts of garlic, cypress, eucalyptus, creosote, and menthol) is of definite value as a tonic in improving appetite and blood count and building-up weight in patients with chronic pulmonary tuberculosis. We do not believe that it has a direct effect on healing the disease but it is a valuable adjuvant in the treatment.

Reference

¹ Ornstein Geo G and Epstein Israel G. *Quar Bull Seaview Hosp (New York City)*, 1 386, 1936

Organization News

BOARD OF REGENTS

There are fourteen Regional Districts of the American College of Chest Physicians in the United States. Members of the Board of Regents and the districts which they represent are listed below

District No 1, Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont

*Dr John B Hawes, 2nd, Boston, Massachusetts — 1941

District No 2, New York State

Dr John N Hayes, Saranac Lake, New York — 1940

District No 3, Delaware, District of Columbia, Maryland, New Jersey, and Pennsylvania
Dr Frank Walton Burge, Philadelphia, Pennsylvania, *Chairman* — 1942

District No 4, Florida, Georgia, North Carolina, South Carolina, and Virginia
Dr Paul H Ringer, Asheville, North Carolina — 1941

District No 5, Michigan, Ohio, Tennessee, and West Virginia

Dr Edward J O'Brien, Detroit, Michigan — 1940

District No 6, Illinois, Indiana, and Iowa
Dr Robinson Bosworth, East St Louis, Illinois — 1939

District No 7, Arkansas, Missouri, and Oklahoma

Dr L J Moorman, Oklahoma City, Oklahoma — 1941

District No 8, Alabama, Kentucky, Louisiana, and Mississippi

Dr Chas R Gowen, Shreveport, Louisiana — 1939

District No 9, Minnesota, North Dakota, South Dakota, and Wisconsin

Dr Jay Arthur Myers, Minneapolis, Minnesota — 1940

District No 10, Colorado, Kansas, Nebraska, Utah, and Wyoming

Dr McLeod M George, Denver, Colorado — 1939

District No 11, Texas

Dr H Frank Carman, Dallas, Texas — 1939

District No 12, Arizona, New Mexico, and Nevada

Dr Victor S Randolph, Phoenix, Arizona — 1941

District No 13, California

Dr E W Hayes, Monrovia, California — 1941

District No 14, Idaho, Montana, Oregon, and Washington

Dr G C Bellinger, Salem, Oregon — 1940

Dr Nagla M LafLoofy, Brooklyn, New York, a Fellow of the American College of Chest Physicians, presented a paper before the Brooklyn Thoracic Society at its meeting on May 20th entitled, "Case Finding through Periodic Contact Examinations"

Dr Jay Arthur Myers, Minneapolis, Minnesota, a Fellow of the American College of Chest Physicians, is the Chairman of the Board of Editors of the Journal Lancet, the official monthly publication of the Minnesota, North Dakota, South Dakota, and Montana State Medical Societies. Many timely and splendid articles on chest diseases appear frequently in the Journal Lancet

Dr F L Loveland, Topeka, Kansas, a Governor of the American College of Chest Physicians, was elected First Vice-President of the Kansas State Medical Society and he is also serving as the Chairman of the Committee on Economics of the State Medical Society

Dr Jesse Carl Painter, Dubuque, Iowa, and Dr Joseph W Post, Philadelphia, Pennsylvania, Fellows of the American College of Chest Physicians, were elected to Fellowship in the American College of Physicians

Dr Robert B Homan, Jr, El Paso, Texas, Secretary-Treasurer of the American College of Chest Physicians, addressed the Grant County Medical Society at Silver City, New Mexico. Dr Homan spoke on Chest Surgery

Dr Leo W Bortree, Colorado Springs, Colorado, President-Elect of the Colorado Medical Society and a Fellow of the American College of Chest Physicians, addressed the meeting of the Northeast Medical Society, Sterling, Colorado

Dr John H Skavlem, Cincinnati, Ohio, a Fellow of the American College of Chest Physicians, was elected Trustee of the Cincinnati Academy of Medicine. On Monday evening, June 13th, Dr Skavlem presented a paper before the Hempstead Academy of Medicine at the Portsmouth General Hospital. The title of the paper was "Tuberculous and Non-Tuberculous Chronic Lung Infections"

Dr David W Heusinkveld, Cincinnati, Ohio, a Fellow of the American College of Chest Physicians, was appointed a member of the Committee on Public Relations of the Academy of Medicine of Cincinnati

*Deceased

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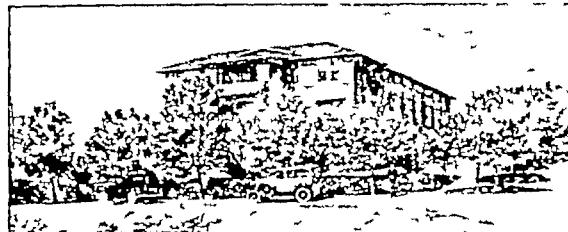
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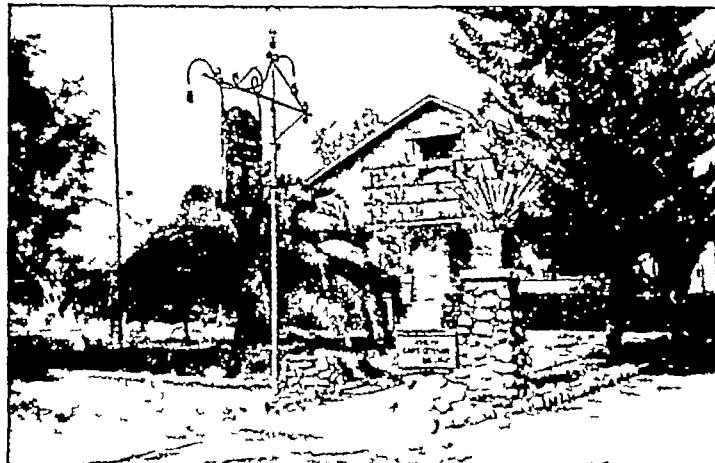
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MEDICAL DIRECTOR

Dr Robinson Bosworth, East St Louis, Illinois, a Regent of the American College of Chest Physicians, has received a joint invitation from the Michigan State Medical Society and the Michigan Tuberculosis Association to give a series of five lectures on tuberculosis to medical societies in five Michigan cities during the month of September

Dr Chas H Cocke, Dr Paul H Ringer, Dr Martin L Stevens, and Dr Karl Schaffle, Asheville, North Carolina, Fellows of the American College of Chest Physicians, were members of a committee which arranged the second annual Tuberculosis Seminar held at Asheville in July of this year. Dr Karl Schaffle, Governor of the American College of Chest Physicians for the State of North Carolina, was the chairman of the committee

Dr J K Shumate, Bayfield, Wisconsin, a Fellow of the American College of Chest Physicians, was elected President of the Ashland-Bayfield-Iron County Medical Society

Dr Chas P Cake, Washington, D C, a Fellow of the American College of Chest Physicians, has been appointed chief medical officer in tuberculosis, effective July 1st, of the Gallinger Hospital at Washington, D C

Dr Albert J Roberts, Ottawa, Illinois, a Fellow of the American College of Chest Physicians, has resigned as medical director of the La Salle County Tuberculosis Sanatorium, a position he has held since the sanatorium was founded in 1919

Dr Louis H Clerf, Philadelphia, Pennsylvania, a Fellow of the American College of Chest Physicians, addressed the Eleventh District Councilor Medical Society at Washington, D C. The subject of his talk was "Bronchoscopy and Pulmonary Infections"

Dr W S Rude, Ridgetop, Tennessee, a Governor of the American College of Chest Physicians, was elected Vice-President for the Middle Tennessee District of the Tennessee State Medical Association and he was appointed Chairman of the State Committee on Tuberculosis

Dr Louis M Limbaugh, Jacksonville, Florida, a Fellow of the American College of Chest Physicians, was elected as a member of the Executive Council of the Florida State Medical Association for a term of three years

Dr James L Hamilton, Chattanooga, Tennessee, a Fellow of the American College of Chest Physicians, was named a member of the State Committee on Tuberculosis

Dr Harry Golembe, Liberty, New York, a Fellow of the American College of Chest Physicians, was elected President of the Sullivan County Medical Society

Dr Hugh M Kinghorn, Saranac Lake, New York, a Fellow of the American College of Chest Physicians, delivered a paper before the 132nd annual meeting of the Medical Society of the State of New York. The title of his paper was "Vaccination Against Tuberculosis"

A committee representing the North Carolina State Medical Association and the North Carolina Tuberculosis Association have been appointed to study plans to raise funds for a suitable memorial to the late Dr Louis B McBrayer, Southern Pines, North Carolina. Dr McBrayer was the Executive Secretary of the North Carolina Tuberculosis Association for many years and active in developing the tuberculosis program of the State of North Carolina. Dr George G Dixon, Ayden, North Carolina, is representing the State Medical Society on the Committee and Dr William H Smith, Goldsboro, North Carolina, is representing the North Carolina State Tuberculosis Association

Texas Tuberculosis Committee

The President of the Texas State Medical Association announces the following physicians who will serve as members of the Tuberculosis Committee of the State Medical Society. Dr R B Homan, Sr, El Paso, Chairman, Dr W D Anderson, San Angelo, Dr C B Carter, Dallas, Dr Sim Hulsey, Ft Worth, Dr A A Ledbetter, Houston, and Dr J B White, Amarillo. Drs Homan, Anderson, Hulsey, and White are Fellows of the American College of Chest Physicians

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MONDAY, SEPTEMBER 19, 1938

9:00 A.M.—Registration—Lobby Floor
10:00 A.M.—X-Ray Clinic
Conductor—Paul A. Turner, M.D., Louisville, Ky.

MONDAY AFTERNOON

Medical Section—2:00-4:30 P.M.

- 1 Intra Pleural Pneumolysis—(Illustrated with slides)
Paul A. Turner, M.D., Louisville, Kentucky
Discussed by Julian A. Moore, M.D., Asheville, North Carolina
- 2 Value of Clinical Research in Tuberculosis—
Andrew L. Banyai, M.D., Wauwatosa, Wisconsin
Discussed by Oscar O. Miller, M.D., Louisville, Kentucky
- 3 Tuberculosis Tracheo-Bronchitis—
Porter Vinson, M.D., Richmond, Virginia
Discussed by V. K. Hart, M.D., Charlotte, North Carolina
- 4 Collapse Therapy in the Negro—
O. L. Ballard, M.D., Louisville, Kentucky
Discussed by Hugh A. Brown, M.D., Alexander, Arkansas

Monday Night

Conference Banquet

Address—H. G. Reynolds, M.D., President, Kentucky State Medical Association, Paducah, Kentucky

Changing Problems—

Chesley Bush, M.D., President, National Tuberculosis Association, Livermore, California

Address—A. T. McCormack, M.D., President, American Public Health Association, Louisville, Kentucky

TUESDAY, SEPTEMBER 20, 1938

Medical Section—9:30-11:30 A.M.

- 1 Bronchiectasis—
H. McLeod Riggins, M.D., New York, New York
Discussed by Frank H. Carman, M.D., Dallas, Texas
- 2 Should Non-Tuberculous Lung Diseases Be Treated in the Tuberculosis Sanatorium?—
W. C. Blake, M.D., Tampa, Florida
Discussed by Champneys Holmes, M.D., Atlanta, Georgia
- 3 Role of Lobectomy and Pneumectomy in Bronchiectasis and Carcinoma of the Lung—
John Alexander, M.D., Ann Arbor, Michigan
Discussed by Herbert Acuff, M.D., Knoxville, Tennessee
- 4 Development of Calcification in Tuberculosis Positive Infants—
Miriam Bralley, M.D., Baltimore, Maryland
Discussed by David Lesesne Smith, Spartanburg, South Carolina

Section Meetings—10:10-11:30 A.M.

Section 1 State and Rural Associations
Presiding Officer, Miss Erle Chambers, Little Rock, Arkansas
What the Average Patient Knows upon Entering a Sanatorium—F. P. Baker, M.D., Talahina, Oklahoma
Educating the Rural Community in Tuberculosis—Mrs. J. C. Wilson, Sheridan, Arkansas

Section 2 Local Organizations
Presiding Officer, Miss Nora Spencer Hamner, R.N., Richmond, Virginia
Responsibility of a Local Association in Planning and

Promoting the Tuberculosis Program—
E. C. Harper, M.D., Richmond, Virginia

Discussion

- 1 In Relation to Official Health Department—
P. P. McCain, M.D., Sanatorium, North Carolina
- 2 In Relation to School Authorities—
Mrs. Ashley Halsey, Charleston, South Carolina
- 3 In Relation to Medical Profession—
Paul A. Turner, M.D., Louisville, Kentucky
- 4 Discussion

General Session—11:35-12:30 P.M.

Certain Aspects of the Program in Massachusetts for the Prevention and Control of Tuberculosis—Frederick T. Lord, M.D., Boston, Massachusetts
The Future Possibilities of the Tuberculosis Problem—J. Burns Amberson, M.D., New York, New York

Tuesday Night—8:00 P.M.

Address—Paul H. Ringer, M.D., President, Southern Tuberculosis Conference, Asheville, North Carolina
J. D. Riley, M.D., President, Southern Sanatorium Association, Booneville, Arkansas
Bruce Douglas, M.D., President, American Sanatorium Association, Detroit, Michigan
Irvin Abel, M.D., President, American Medical Association, Louisville, Kentucky

WEDNESDAY MORNING, SEPTEMBER 21, 1938

Symposium on "Value of Sanatorium Treatment"

- 1 From Standpoint of a Sanatorium—
W. Atmar Smith, M.D., Charleston, South Carolina
- 2 From Standpoint of General Practitioner—
Walter E. Vest, M.D., Huntington, West Virginia
- 3 From Standpoint of the Laity—
Miss Clara Pennington, Fort Worth, Texas
- 4 From Standpoint of the Patient—
W. A. Doppler, Ph.D., National Tuberculosis Association, New York
- 5 From Standpoint of the County Health Department—
R. A. Brown, M.D., New Orleans, Louisiana

General Session—11:15-12:00 P.M.

The Responsibility of the National Tuberculosis Association for State and Local Programs—Kendall Emerson, M.D., Managing Director, National Tuberculosis Association

Address—C. Howard Marcey, M.D., Pittsburgh, Pa.

Wednesday Afternoon

Joint Session—2:40-4:30 P.M.

- 1 The County Health Department in the Control of Tuberculosis—
Charles D. Cawood, M.D., Lexington, Kentucky
Discussed by Paul A. Yoder, M.D., Winston-Salem, North Carolina
- 2 Some Historical Aspects of Tuberculosis—
Lewis J. Moorman, M.D., Oklahoma City, Oklahoma
- 3 Observations on the Tuberculin Patch Test (Vollmer)—
Thomas B. McNeeley, M.D., U.S.P.H.S., Washington, D.C.
Discussed by P. P. McCain, M.D., Sanatorium, North Carolina
- 4 The Tuberculosis Problem in the Negro Schools and Colleges—
Paul B. Cornelly, M.D., Washington, D.C.
Discussed by C. St. C. Guild, Director of Tuberculosis Among Negroes, National Tuberculosis Association, New York

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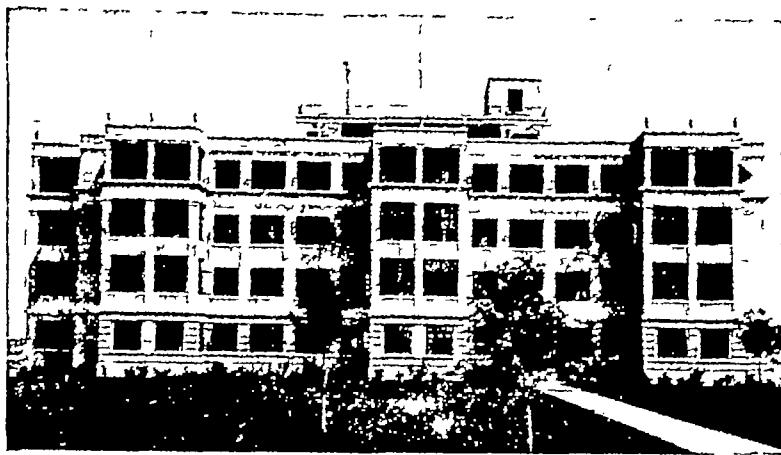
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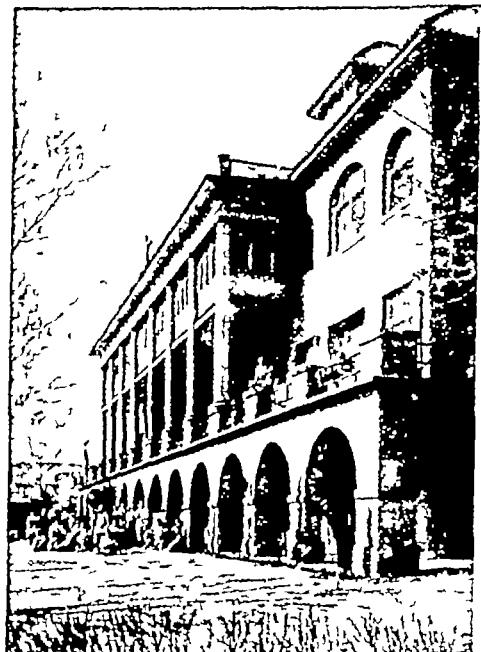
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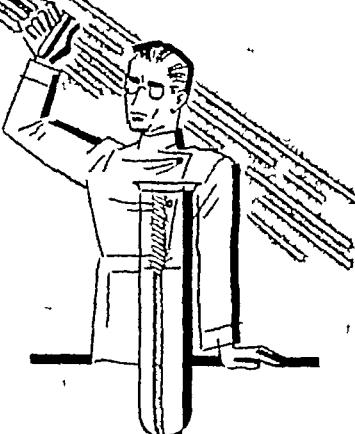
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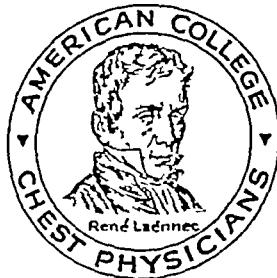
LIPIODOL (LAFAY)

DISEASES

OF THE

CHEST

Official Organ of the Amer College of Chest Physicians
 Editorial offices 1018 Mills Building, El Paso, Texas
 Business Address P O Box 1069, El Paso, Texas
 MEMBER ASSOCIATED EDITORS OF TUBERCULOSIS PUBLICATIONS



(A MONTHLY PUBLICATION)

Subscription United States and
 Canada \$2 00 per year Other
 countries \$2 50 per year
 Entered as second-class matter
 August 18 1936, at the post office
 at El Paso Texas, under the Act
 of August 24 1912

Editorial Comment

AMBULATORY The use of the above term
PNEUMOTHORAX requires elucidation

The legitimate lung specialist, when speaking of using ambulatory pneumothorax, means keeping the patient at absolute rest in bed, with pneumothorax treatment of the affected lung, until long after all clinical signs and symptoms of activity of the tuberculous process have subsided, *then*, and *then only*, does the patient become ambulatory, receiving refills as often as necessary to maintain the necessary amount of collapse of the affected lung

It is agreed by almost all worthy authorities on the subject that the best place for the period of absolute rest is the climatologically located, well conducted and equipped, modern Tuberculosis Sanatorium, next best the local hospital, and least favorable is bed rest at home

Charlatans and unscrupulous opportunists known commonly as quacks, frequently take advantage of the lack of knowledge concerning the real meaning of ambulatory pneumothorax, common to many physicians and most of the public, and encourage patients

afflicted with active pulmonary tuberculosis to continue with their work the entire time of treatment. The patients thus treated gain weight and look improved due to lessened absorption of toxins from the affected area in their lungs, but the same forces which brought catastrophe to the first lung are still operating and in a variable length of time, usually within the first couple of years, there is spread to and break-down in the other lung, before the first lung has healed

The only apparent reason for such handling of a case is that the patient is thus able to continue payments to the unscrupulous physician, which, by proper rest treatment would be interrupted. This view is substantiated by the fact that we seldom see cases who are unable to pay for any treatment handled in such a manner, nor those who are able to pay if they do stop work

If the medical profession and laity are not informed on this important subject, so that the quack is checked, the most valuable half of the treatment of Pulmonary Tuberculosis, Local Rest of the part containing the tuberculous lesion, will come into disrepute

F W B

PHILADELPHIA-PENNSYLVANIA PLAN RECEIVES OFFICIAL STATE ENDORSEMENT IN PENNSYLVANIA ON Friday, May 13th, 1938, Doctor Edith MacBride - Dexter, the progressive Secretary of Health of the Commonwealth of Pennsylvania, gave unqualified endorsement to the Philadelphia-Pennsylvania Plan

“May 13, 1938

“Dr Frank Walton Burge,
1930 Chestnut Street,
Philadelphia, Pennsylvania

“Dear Dr Burge

“I heartily approve the Philadelphia, Pennsylvania Plan for Tuberculosis

“With all good wishes for success, I am

“Sincerely yours,

(signed) *Edith MacBride Dexter*
“EMD R Secretary of Health”

Doctor Dexter has already been foremost in the Nation in Sanatoria Building Program

“Sanatoria Building Program”

“Our three sanatoria at present have a capacity of approximately 2400 beds, and we usually have a waiting list of from 700 to 1000 patients. In order to take care of these, we plan to increase our capacity by thirteen or fourteen hundred beds. This will more than absorb our present waiting list and will provide facilities for the treatment of patients discovered by the new case finding program in which the Department of Health is engaged.

“Our building program under the State Authority includes a new sanatorium in Western Pennsylvania for 500 adult patients and a wing for 50 children suffering from adult type tuberculosis, administrative offices and staff rooms, a dormitory for 100 patient employes—50 men and 50 women—and a dormitory for 100 non-patient employes—50 men and 50 women.

“Hamburg will have four new units which will give an additional 200 beds for patients and also a new home for nurses. Ground was broken for this work on November 22, 1937.

“Mont Alto, where the buildings are antiquated, will have a new children’s hospital with a capacity of 325 beds for children who have childhood type tuberculosis, an infirmary for about 500 adult patients, a wing for 75 children who are suffering from adult type tuberculosis, a new kitchen and dining room, a new home for nurses replacing the present buildings, quarters for 75 non-patient men employes and a dormitory for 100 women non-patient employes. Careful studies of modern tuberculosis institutions were made so that every advantage could be taken of new developments in hospital design.”

With adoption of the Philadelphia-Pennsylvania Plan, we now have assurance that the facilities thus afforded will give the maximum benefit to the people of small income in the State of Pennsylvania. F W B

ENTHUSIASTIC TUBERCULIN TESTING SOME sections of Georgia, including the Atlanta area, have just emerged from a smallpox scare. The usual hysteria that accompanies such things prevailed. After it was all over, it was shown that there were only eight cases of proved smallpox. The excitement of the general populace at one time reached a feverish pitch, and resulted in a wholesale vaccination of the good citizenry. The doctors’ offices, as well as those of the public health agencies, were inundated with the flood of the eager seeking protection from this scourge. They did not have to be solicited, did not have to have the rationale of vaccination presented to them. In other words, they did not have to be sold on the protective value of vaccination. In the hysteria of the outbreak, fanned into flame somewhat by notices in the lay press, they took the initiative and flocked in droves to the medical profession. This was a fine thing, for it resulted in a general vaccination against this dread malady. There were many who did not need it, but on the other hand there were those who did. It was surprising to discover the large number of individuals who had never been vaccinated before. That section of Georgia, therefore, is protected from smallpox for many years to come.

If only there could be some stimulus to

prod the people into similar action with regard to tuberculosis, to make them flock in a similar manner to the doctors for a tuberculin test, chest examination or an x-ray film of their lungs. Except in the densely populous areas, the universal application of the tuberculin test followed by an x-ray examination of the positive reactors would go a long way in the control of this disease. The incidence of positive reactors in the large urban communities is so great, that from an economical point of view the universal application of this procedure would not be practical. It is theoretically and practically sound, however, that everywhere, the people become tuberculosis minded and lend concerted efforts toward its eradication.

Except in an insignificant minority, there is no invasion of the lungs at the time of the primary infection in childhood. There follows a period of latency of several or more years until the teen age, or somewhat later, when involvement of the lungs occurs. Investigation during recent years of the epidemiology of tuberculosis has emphasized this latency, this rather striking period of inaction intervening between early life and the adolescent or young adult age. It has resulted in intensifying the search for tuberculosis between the ages of 15 to 25. The examination of all individuals in this age group would approach accomplishing in tuberculosis what vaccination has accomplished in smallpox. A tuberculin test as a screen, would aid greatly in limiting the extent and cost of such a program. As called to attention by Myers, x-ray films at this time frequently reveal lesions in the lungs one to three years before the advent of symptoms. Who can deny that with our modern methods of treatment this is the time to strike, the time to make a bid for a cure?

While there is no intent, and certainly no desire, to belittle the menace of uncontrolled smallpox, nor fail to laud the almost complete eradication of this horrible disease from our midst, it is to be deplored that a parallel enthusiasm has not been engendered in our anti-tuberculosis campaign. Let it not be forgotten that tuberculosis is the leading cause of death in the most productive period of the life of man-kind.

C H H

**RED CROSS
FIGHTS
TUBERCULOSIS
ABROAD**

In India, with a view to stimulating the interest of its members in the fund which Her Excellency the Marchioness of Linlithgow, Vicereine of India, is endeavouring to raise for a nation-wide campaign against tuberculosis, the Indian Red Cross Society issued a Special Tuberculosis Number of its *Journal* in March-April. This number contained an article on *The Peculiarities of the Tuberculosis Problem in India*, by Major-General Sir Cuthbert Sprawson, Kt., late of the Indian Medical Service, a summary of the proceedings of the Empire Conference on the Care and After-Care of the Tuberculous, resolutions on tuberculosis adopted at the International Rural Hygiene Conference at Bandeng, and the news of the King George Thanksgiving (Anti-Tuberculosis) Fund.

In a preface to the number, the Editor points out that tuberculosis has increased rapidly in India during the last three decades and that, unless steps are taken to prevent the spread of the disease, it will soon take a predominant place among the causes of death. In this connection, it is interesting to note that a tuberculosis clinic has now been started in Baroda City under the auspices of the Red Cross.

In Greece, the Red Cross Public Health Center in Athens, which is very active in the crusade against tuberculosis, has undertaken during the last few months the vaccination of 10,000 new-born infants and 1,200 older children by means of B C G Serum. The results have proved so satisfactory that the Ministry of Health has requested the Red Cross to organize similar vaccinations in the provinces. The local branches in Salonika, Volo and Canea have already taken the necessary steps to give effect to this request.

In Colombia, the Red Cross, which barely three years ago opened the "Nemesio Camacho" refuge, will shortly be opening an anti-tuberculosis dispensary which will be the pride of Bogota, having cost \$90,000.00. The Society is also working on plans, in collaboration with the Colombian government, for the construction of two hospitals for the treatment and prevention of tuberculosis.

C M H

ADDRESS of the INCOMING PRESIDENT

American College of Chest Physicians *

CHAMP H HOLMES, MD, FACP

Atlanta Georgia

At that time in the future when my head is hoary white (and the mirror tells me the beginnings of that are here), when the stamp of advancing years rests upon my brow, I shall turn back the pages of time to this occasion, and mark with gratitude this day when it became my distinctive privilege to be made president of the now great American College of Chest Physicians. It is a college of which organized medicine boasts, a college to which the nation proudly points and a college from which mankind with a prayer of thanks acknowledges benefaction. A warm sense of satisfaction comes over me in the realization that I was elected to this office during the struggle of our genesis, in the misty dawn of our career. A glowing pride fills me to have seen the mists dissipate and our efforts crowned with the glory of success.

As I sit musing, I see again through the haze of tobacco smoke (whether it is to be the smoke from pure Havana, or that from the more lowly ingredients of a roll-your-own, I suppose the New Deals of the future will determine), but I see again the faces of many of you just as I see them now crystallized into the reality of the present. I recapture that urge, that spirit which caused our early aims and ideals to come to fruition. I see again in passing review a parade of our earlier milestones of progress—the attempt to lend a helping hand to the private sanatorium in its losing battle, the publication of *Diseases of the Chest*, carrying its helpful message to the general practitioners over the land, efforts to further and improve the teaching of chest diseases in our medical schools, the creation of a pneumothorax directory, activity in forming committees within the state and county medical societies to advance the study, treatment and control of tuberculosis and to improve the conditions of both patient and doctor in the sanatoriums, and organized effort



to stimulate interest in, mould legislation for and, in general, promote the status of, diseases of the chest.

Several weeks ago in New York, I heard the incoming president of the American College of Physicians liken that organization to a large ground bird. He did so most attractively and cleverly and with consummate attention to detail. I, however, am inclined to draw briefly my metaphor of this organization in terms of man. At Albuquerque we were born—a lusty sturdy infant, groping, a little confused, not knowing exactly where he was going, but going somewhere. Kansas City saw us a growing, rugged youngster with as yet only a dimly perceived objective—but on his way. At Atlantic City came the full bloom of adolescence. Ideals and ambitions surged in this youth. He began to see the way. Today, in this lovely city of San Francisco, we find ourselves a full grown man—a young man, but one fired with the eagerness, the strength and the determination to pursue his goal. He knows where he is going.

Members of the American College of Chest Physicians, ours is a splendid organization. Our task is great, our future bright! We have accomplished much—much remains! So let us all make a concerted effort to forge onward toward our goal. The pioneering trail we have blazed lies clearly before us and surely leads by an ever widening path to the gleaming white pavement of the open highway just ahead, the highway of our destiny.

In the office of president with which you have honored me, I pledge with all that is best in me, to lead—with a dignity, a zeal and a loftiness of purpose.

* Delivered at the Fourth Annual Meeting of the American College of Chest Physicians held at San Francisco June 12, 1938

Examination of the Chest

ROBERT B SANDERSON, M.D., F A C.P
South Bend Indiana

THE general treatment of any particular disease has a tendency to change as new information is added to what we already know and as procedures, medications, etc that are of no, or doubtful value are discarded. In other words, our present treatment of any particular disease is the gradual result of the evolution of procedures which at present find themselves among the essential parts of a presumably rational program. A very simple example of this evolution of therapeutics is the disease of diabetes, a condition which in its early history was probably treated by an effort to replace the water and the sugar lost. The rational treatment is sufficiently complicated and, with the introduction of insulin, sufficiently well organized to be considered as having been brought under control. This was accomplished by a series of evolutionary procedures which have become fairly well standardized although they are sufficiently elastic to be applicable to the various individual conditions met with in any particular patient. Much, therefore, has been done in the way of adding to and taking away from our ideas of rational treatment.

No less may be said of the treatment of tuberculosis and the various other chronic pulmonary affections met with almost daily in a fair sized chest clinic. From the program of isolation, rest, and fresh air of the early twentieth century, a procedure or group of procedures which was almost universally prescribed for all tuberculous patients, to a series of individual procedures manifested by various forms of collapse therapy, which characterize the present day treatment of tuberculosis, shows that the physicians of the period have found it necessary to add to their armamentarium of therapeutics and to take away from their so-called list of useful procedures. In the process of adding to and taking away, the treatment of tuberculosis has not only evolved into a fairly standardized procedure which also admits of individualization, but has also attempted to extend the usefulness of the therapy to a larger

number of patients. In the last analysis, the test of a satisfactory therapeutic procedure should be First, that the procedure promises a relatively high prospect of success, and second, that the procedure should be applicable to a relatively high number of patients who have been found to be affected with a certain disease.

The finding of the disease, in other words the diagnosis of the condition and the art and technique of the science of diagnosis, has evolved as rapidly, or perhaps even more so than the treatment, it is our purpose at this time to attempt, if possible, to review briefly the various procedures which have been considered as essential parts of the diagnosis of pulmonary conditions and to point out those that have at this time a rational basis as well as those that may be for the most part relegated to a position of insignificance, if not uselessness.

It was only a short time ago that the medical student was given extended lectures on the technique and science of physical diagnosis, a great amount of which time and study was devoted to the chest. It would be interesting to know the percentage of wasted effort attendant to the didactic method of teaching physical examination of the chest. It perhaps would be unfair to say that nine-tenths of this effort was wasted and yet there is scarcely a medical student who would not admit that his courses on physical diagnosis of the chest were practically useless. Now the fault did not lie particularly with the physician who was teaching and certainly not with the student who was as anxious as any one to obtain the knowledge, develop the science, and learn the art of diagnosis. The fault probably lay, if there was a fault, with the underlying principle of physical diagnosis teaching. That principle was to the effect that physical diagnosis of the chest could be taught, when as a matter of fact, it appears quite certain that such knowledge can only be obtained by doing. Much time was spent in these lectures upon the significance of auscultation, percussion, and palpation, stu-

dents were frequently chided because they were unable to percuss with accuracy the borders of the heart, and while we are discussing that it might be interesting to note that the teacher would percuss the heart with accuracy, while none of his students were able to do the same

It may be startling, but at the same time encouraging, to know that the present writer has never to his knowledge been able to satisfactorily percuss the borders of a normal heart. And herein lies one of the first facts of the older conception of the diagnosis of pulmonary conditions, and that fact is that many of the conventional methods of physical diagnosis of the chest are of insignificant value and the sooner the physician gets that clearly in mind the more rapidly will he become expert in the diagnosis of pulmonary pathology.

Every one is familiar with the general technique of percussion, but few seem to be familiar with its limitations. So many times it happens that the chest is percussed and when the sounds appear to be relatively normal the conclusion is arrived at that the patient has no pulmonary pathology. The same is true of palpation, of inspection, and of auscultation. It is probably truer of auscultation than of any other part of the examination for the reason that auscultation of the chest has for so many years been looked upon as a satisfactory examination of the chest, but one does not need to examine many chests and follow this procedure with more accurate methods of diagnosis until he finds startling evidence of the fact that even auscultation itself has a tremendous percentage of error. It might be said with a fair degree of accuracy that ninety per cent of the patients with significant pathology in the chest will show significant ausculatory changes. However, a ten per cent mistake in diagnosis of the ordinary chronic pulmonary affections is far too high and for that reason it would seem that auscultation of the chest should be given weight only when it reveals evidence of definite pathology and that its significance in the absence of evidence of pathology should be relegated to a relatively insignificant part of the examination. In other words, the weight of evidence collected by auscultation is heavy when there is evidence of pathology, but light when there is

no evidence of pathology.

What then can we do to increase our percentage of correct diagnoses and at the same time decrease our mistakes? Well, obviously the answer to that is one word and that word is thoroughness. By thoroughness I mean a more complete examination, and I venture to suggest the following procedures as being imperative to a complete examination of the chest. First, x-ray of the chest, second, a history of the patient's condition, third, physical examination of the chest, and fourth, a laboratory examination of the sputum and blood.

If we are to obtain any considerable degree of accuracy in our diagnosis of pulmonary conditions, we must assume the attitude that the patient's chest must be proved to be healthy before we give an opinion to that effect. This procedure necessitates the regular and routine use of those procedures just mentioned.

It is not my purpose to go into detail concerning the indications for these examinations, since it is assumed that each of these examinations is indicated in each and every new patient that comes to us and certainly should be repeated at intervals of at least one year from then on as long as the patient lives. Many times we are reminded in the course of the re-examination of patients that we neglected to do something which was extremely important. After years of observation we discover sputums that are positive and many times after long periods we discover from x-ray examinations that the pathology has extended markedly, when neither the symptoms nor the physical examinations suggested such changes.

I am aware of the fact that the reader will immediately conclude that the expense of such examinations is so great that they can not be routinely performed. To this argument I would suggest that the expense of removing an appendix is something which many people can not afford. Yet there are no cases of acute appendicitis that can not be operated upon immediately, if the facilities are available, regardless of the patient's financial condition.

If at present, the usual laboratory procedures are too expensive for general application then it is one of our responsibilities to make these examinations available as well as more

general

There is a tremendous amount of controversy with respect to the part of the examination which should be performed first. It would seem that that part of the examination should be performed first which promises the highest degree of accuracy and the greatest amount of information in the least time and at the least expense. Now it so happens that all of these conditions do not fit into one single picture, in as much as that part of the examination which promises the greatest information and has about it the highest degree of accuracy in diagnosis is not the least expensive. I refer particularly to the x-ray. Yet when the patient's time as well as the time of the physician, the anxiety concerning the possibilities of error, the possibility of delayed diagnosis, etc. are taken into consideration, it would seem that the first and most important thing which we can do in examining a patient is to take an x-ray, single film, of the chest, and it certainly is a fact that no patient whose chest is being examined should be either diagnosed or treated unless the physician is thoroughly familiar with the x-ray appearance of the chest. Varying degrees of thoroughness will suffice to satisfy the physician that he is sufficiently familiar with this part of the examination for him to continue his treatment, but only a small amount of experience is necessary in both fluoroscopic and x-ray

examinations of the chest for us to find that the re-examinations of patients impresses us with the fact that unless our information is relatively recent it is very likely to be greatly in error. I am reminded of a typical example of a patient, which will be referred to briefly. A woman was operated on in a well known hospital for some pelvic pathology. Two or three days later she developed symptoms of pulmonary pathology which was diagnosed on physical examination as a pleural effusion. The clinician decided to aspirate the chest. One of our assistants recommended that the chest be x-rayed and if possible fluoroscoped before any attempt was made at aspiration, and he suggested as an argument the thought that the fluid, if present, could be more accurately located. This advice, however, was not followed and several attempts were made to aspirate without success after which (the next day) the patient was an example of the clinical investigation of pulmonary conditions. All of the indications were present for x-ray and fluoroscopic examination before the aspirations were attempted.

The clinicians who are treating tuberculosis have recently developed a slogan which refers to the parenchymal excavations called cavities. This slogan is "Close That Cavity!" And may we suggest for the clinician who is interested in diagnosis the slogan "Examine That Chest!"

The Use of Postural Drainage in Suppurative Lung Conditions

PAUL M. HOLMES, M.D., F.A.C.P.
Toledo, Ohio

POSTURAL drainage for lung suppurations is not being used as often, correctly, or as persistently as its merit deserves. The purpose of this article is to add my experience to an already voluminous literature extolling the value of this very old but effective therapeutic procedure. There are two possible reasons for the neglect in recent years to use gravity drainage first, its simplicity, and second, the perfection of surgical and medical methods that promise quicker and more dramatic results. The attention of the medi-

cal adviser has been drawn away from the simpler medical measures and focused upon bronchoscopy, phrenicotomy, artificial pneumothorax, pneumo-peritoneum, lobectomy, surgical drainage, and thoracoplasty. My purpose is not to disparage the use of these latter procedures when indicated, but to urge the conscientious use of gravity drainage as a first method of attack. Many patients may be saved from surgery by the proper use of postural drainage. When one has seen case after case of a variety of suppurative lung

lesions completely recover after the application of gravity drainage alone, a sensible enthusiasm for the method is bound to follow

I have used gravity drainage with varying degrees of success in four main types of lung suppurations (1) lung abscess, (2) bronchiectasis, (3) tuberculosis, and (4) empyema with broncho-pleural fistula

Success in this form of therapy requires free drainage from the lesion into a main bronchus and is greatly enhanced when the lesion is located in the lower two-thirds of the lung. Abscesses and bronchiectasis of the apices have, in my experience, proven intractable, in spite of the fact that it appears simpler mechanically to get good drainage from the apices than from the bases of the lungs. Therefore, unless these apical lesions respond promptly, I move on to more radical measures. Basal lung abscess with free bronchial drainage clears up rapidly, but the higher the abscess or other suppuration, the less responsive it is to conservative treatment.

Many cases of bronchiectasis, if not too chronic and far advanced, make a complete recovery if postural drainage is used carefully and correctly over a long period of time. Failures are due to the dilatory and too brief use of drainage. Even the most advanced cases are improved by the daily evacuation of foul sputum.

In a few instances, I have used the method as an adjunct to surgical drainage of empyema cavities where there has been a broncho-pleural fistula. This has relieved the cough, increased the total amount of drainage, and hastened the recovery of the patient.

In tuberculosis, gravity drainage can assist in clearing the bronchial passages of sputum, thereby concentrating coughing to a relatively brief period. Often, when basal thick-walled cavities near the hilus are resistant to all collapse therapy measures, postural drainage for two hours daily will assist in their closure.

One must not be too timid in the selection of patients for postural drainage. Some of the most dramatic results in my experience have been on patients that appeared too sick to tolerate any manipulation whatsoever. They certainly were poor surgical risks and I merely used gravity drainage as a method of last resort. The aged and the arteriosclerotic do not tolerate the head down position,

yet a moderate drainage position may bring surprisingly good results. Patients who expectorate blood before or after institution of drainage may be continued if bleeding is sporadic and does not increase.

The technique consists in having the patient placed in a position that will permit drainage of the affected area by gravity. If the lesion is located at the base, the patient is instructed to hang over the edge of the bed for five minutes several times the first day, with the thorax as nearly perpendicular as possible. Each day the time is increased by several minutes, according to individual tolerance, until three or four hours daily are spent in the perpendicular position. After the patient becomes accustomed to the inverted position, the drainages may be consolidated into two, but not more than three, daily periods of from one to two hours each. If the last drainage is taken just before bedtime, it will not be necessary to elevate the foot or head of the bed for night drainage. In fact, I think any attempt to get drainage upon a sleeping patient is not only unnecessary, but dangerous, as infection may be carried to a sound lung. The patient should be trained to sleep, if possible, upon the back, abdomen, or the affected side. If the two main bronchi can be kept on the same horizontal plane, chances of infecting the contra-lateral lung will be greatly decreased. Adequately controlled drainage during the waking hours is sufficient.

For chronic lesions, such as bronchiectasis, the drainage bed or "trough" that can be raised and lowered mechanically is advisable, especially for children. There are many inexpensive beds and frames in use that can not only be raised and lowered, but tilted from side to side, facilitating drainage from any part of the lung. Several years ago Doctor Alex Forster kindly loaned me the blue prints of an inexpensive frame he had devised for postural drainage. I have had several of these frames made for the use of chronic suppurations. Recently a young woman visited me with her husband and two fine children, who as a young girl had spent a considerable part of three years on one of these frames draining her bronchiectasis cavities. She has been without symptoms for seven years.

The following cases are chosen to illustrate technique and results.

Case I Mrs I R, druggist's wife of 45, had been taking "pelvic treatments" consisting of tamponades, cervical dilatations, and leg exercises for four months during the summer of 1933. In October, while still taking these treatments, she developed a pain at the base of her right lung accompanied by a high fever, exhaustion, and some cough. I saw her in the latter part of November and found a large abscess in the lower right lobe. There was good drainage of a foul, thick sputum, the patient was extremely ill and very emaciated, her pulse was 138, temperature 104, and respiration 40. Due to the critical condition of the patient, postural drainage was advised as being the only method of treatment that could be used with reasonable safety. She was placed crosswise upon a double bed with the trunk hanging down for two minute periods every hour during the first day. The time was gradually increased, until in two weeks, she was draining for thirty minutes every four hours. She was encouraged to cough while in the drainage position. In a few days her general condition began to improve as evidenced by a fall in temperature, pulse, and respiration. As much as 750 cc of thick sputum was drained daily. At the end of one month, the sputum had disappeared and along with it all symptoms of toxemia. She made a complete recovery and has stayed well for the last four years. Recent x-ray pictures showed both lung fields to be clear. This abscess was of embolic origin. Certainly surgical or bronchoscopic drainage was out of the question.

Case II C K, female, a factory worker of 26, with an abscess in the left lower lobe of two months' duration, was scheduled for surgical drainage. The surgeon was induced to give postural drainage a try, even though bronchial drainage was not satisfactory. The patient was able to start off with fifteen minute periods and after the third day she said "something broke loose" and a great quantity of sputum "rushed out". In two weeks the cough and sputum had ceased and in three weeks the x-ray showed that the abscess had disappeared completely. That was three years ago and there has been no recurrence.

Case III H K, male, age 32, had pnu-

monia in the winter of 1935 followed by a right-sided empyema with broncho-pleural fistula. After a wait of a few weeks, surgical drainage was instituted with a fair amount of drainage. Cough with considerable sputum was also present. The improvement was so slow and the patient's condition so critical that postural drainage was suggested as a possible aid. Gravity drainage was started cautiously and gradually increased. The amount of drainage by mouth was 300 to 600 cc daily and in a short time the condition of the patient began to improve, recovery occurring in six weeks with complete closure of the broncho-pleural fistula. There has been no recurrence.

Case IV L K, female, age 23, bronchiectasis of the right base for eight years, was raising large amounts of sputum which was occasionally blood streaked, extreme clubbing of fingers and toes was present, and she was very much under weight. Phrenicotomy and artificial pneumothorax had been tried without success. Postural drainage was started on ten minute periods every four hours and gradually increased up to three hours daily, no night drainage was used. In one month the cough and sputum had decreased fifty per cent and at the end of six months both had practically disappeared. The general condition of the patient improved and the fingers and toes appeared normal. Three years have passed and while thirty minute drainages are kept up morning and night as a matter of prevention, there is no cough and very little sputum and that principally in the morning.

Conclusions

I Postural drainage is an effective method of emptying suppurative lesions, particularly those located in the lower lobes.

II The patient should be placed in the drainage position during the daytime and encouraged to sleep on the back, abdomen or on the affected side, thus preventing the direct contamination of the sound lung.

III The position and time advised should be based upon the location of the lesion and the age and general condition of the patient. Enough time must be used to allow thick, heavy secretion to be completely evacuated.

A Review of Two Hundred Cases of Pulmonary Tuberculosis Treated by Collapse Therapy

HENRY BARENBLATT, M.D. *
Browns Mills, New Jersey

THE two hundred cases herein reported were selected for collapse therapy from five hundred admissions to Deborah Sanatorium during the past five years. They are composed of patients of the white race, male and female in about equal proportions, between the ages of fifteen and fifty-five.

The various recognized forms of collapse therapy were utilized in accordance with accepted indications. Artificial pneumothorax either as the sole procedure, or supplemented by pneumolysis or oleothorax or both predominated in the vast majority of the cases. Temporary phrenic interruption, with or without scalenotomy, was offered to the patient only when the cavity was small or moderate in size and surrounded by lung tissue more or less free of disease.

About 88 per cent of the patients (Table I) were admitted with far advanced disease. In seven instances of minimal pathology, collapse therapy became necessary because of the development of cavitation while the patients were receiving bed rest treatment. In eight other cases pneumothorax was induced in the absence of cavitation because of progression of the infiltrative process (Table II).

Table I — Stage of the Disease

Minimal	7
Moderately Advanced	18
Far Advanced	175

Table II — Location of Cavities and Extent of Disease

	Unilateral	Bilateral
Apex	18	3
Upper Lobe	102	44
Middle Lobe		6
Lower Lobe	6	3
Perihilar	3	
Diffuse Infiltration	7	8

By reference to table II, it can be seen that unilateral tuberculosis was encountered in 136 patients, while in 64 others the disease was bilateral. As was to be expected, the greatest majority of the cavities were situated in the upper lobes.

Artificial pneumothorax was the method of choice in all cases, the other procedures being supplemented or substituted only when closure of the cavity was not achieved by the former. The clinical and anatomical results are shown in table III-A.

Table III-A — Clinical and Anatomical Results in Pneumothorax Group

	Unilateral—182	Bilateral—18
Effective	93	12**
Ineffective	88	6
Sputum Negative	93	12
Quiescent	9	
Apparently Arrested	84	12
Dead	1*	0

*The death in this case was due to pleural shock.

**In 2 cases the collapse of the lung contralateral to the pneumothorax was made effective by a phrenic in one, while in the other thoracoplasty was substituted.

Of the 88 unilateral and of the 6 bilateral cases in which a satisfactory pneumothorax could not be established, either because of the lack of a free pleural space or because of widespread adhesions, 36 were referred to surgery. Table III-B and III-C show the results obtained by phrenic interruption and thoracoplasty respectively.

Table III-B — Results in 24 Cases of Phrenic Interruption

Cavities Closed	11*
Cavities Open	13
Sputum Negative	11
Apparently Arrested	11

*In one case a scalenotomy was added to the phrenic.

* Medical Superintendent, Deborah Sanatorium, Browns Mills, New Jersey.

Table III-C — Results in 12 Patients Subjected to Thoracoplasty

Cavities Closed	9
Cavities Open	1
Sputum Negative	9
Apparently Arrested	9
Dead	2*

*Both deaths were post operative

By comparison, it might be interesting to know what happened to the 74 remaining patients of this latter group in whom collapse therapy of one type or another could not be utilized. This is revealed in Table IV

Table IV — Fate of 74 Patients in whom Collapse Therapy could not be Utilized

Apparently Arrested	14
Quiescent	12
Improved	19
Unimproved	27
Dead	2

The complications encountered have been surprisingly few. Pleural embolism or shock and adhesions have already been mentioned. As for pleural effusion and empyema one may consult Table V, which is self explanatory. Superimposed spontaneous pneumothorax occurred in 4 patients, all of whom responded favorably to aspiration.

Table V — Complications—Pleural Effusion

Total Number	31
Slight	14
Absorbed	4
Not Absorbed	10
Moderate	9
Absorbed	5
Not Absorbed, had to be tapped	4
Massive	3
Absorbed after tapping	3
Empyema	5
After spontaneous	2, both absorbed after tapping
After a thoracoplasty	1, still being tapped
After massive pleural effusion	2, absorbed after tapping

SUMMARY

- 1 A group of two hundred cases was studied
- 2 These included unilateral and bilateral cases
- 3 Various forms of collapse therapy were applied
- 4 Results and complications are enumerated in the various tables

X-Ray — Sputum — and Pneumothorax*

LAWRENCE SCHLENKER, MD
St. Louis Missouri

"A COUNTRY doctor needs more brains to do his work passably than the fifty greatest industrialists in the world require," writes Walter B. Pitkin, and this, you will agree, holds for the general practitioner anywhere, his difficulties increase with each issue of the calendar. To make these problems somewhat less in number, the paragraphs that follow have been set down for pulmonary tuberculosis, a sickness still the commonest of all diseases in those between the ages of 15 and 30. If one further adds to the last

statement the opinion that tuberculosis is also the most curable of the chronic diseases, a review of its diagnosis and treatment in a time when it is curable, is all the more in order.

It has become a conviction that, above all other things the best asset the tuberculous patient can have is a disease confined to one lung and that, a lung not adherent to the chest wall. With few exceptions, there must have been a time in the life of every victim of tuberculosis when pneumothorax could have been used effectively. With the passing of that time tragedy walked in on the patient and his doctor. It is equally evident

* Read before the St. Louis Medical Society at its regular meeting March 1, 1938

that had the comparatively innocent procedure of pneumothorax been thought of in time, the much more hazardous operation of thoracoplasty would have been called for less often. With this before us, and for the sake of effectiveness, but three subjects will be spoken of: x-ray examination of the chest, examination of the sputum, and pneumothorax treatment.

Any cough lasting more than three weeks, the spitting of blood, or the occurrence of an acute pleurisy calls for an x-ray picture of the patient's chest. There can be no temporizing with this rule. To depend upon symptoms and signs is living in a realm of false security often fatal, for early tuberculosis has indifferent symptoms and no characteristic signs. When rales are present the case is already advanced. A roentgenologist is within reachable distance of practically every person, and he will give your patient the benefit of his services at a cost which can be met, if you lay your case before him. In most municipalities and counties, x-ray examinations are furnished free to the indigent sick when the attending physician requests it, and the single film, properly taken, is sufficient for ordinary diagnostic purposes. Cost then, is no valid excuse for neglecting this necessary procedure. As the material part of the picture is its interpretation, it seems superfluous to stress here that analysis of the film should come from one who has had much experience in the work.

In rank equal to the x-ray stands examination of the sputum, they go together. The sputum establishing the diagnosis, the film showing the extent of disease. A container for collecting the sputum should be given the patient on his first visit. (Containers are furnished without charge by all laboratories.) That sputum first brought up in the morning will most likely show the bacilli, and tubercle bacilli in the sputum means the person has tuberculosis. Should the first report be negative, have it examined again, and again, until at least six examinations have been made, one negative examination is altogether inadequate.¹ Thin or scant sputum

should first be concentrated. Unless the practitioner has the ability to unquestionably recognize tubercle bacilli, he had best leave these examinations to the laboratory, remembering, that a laboratory report is only as good as the man who made it. Private laboratories are found in all large centers, for those who desire privacy. Municipal and state health departments everywhere do this work free of charge.

Having made his diagnosis, a definite responsibility now rests on the attending physician as to the treatment planned, and he would do well by promptly calling in one who has a wide knowledge in the employment of pneumothorax treatment to determine the possibility of giving this particular patient the advantages it offers. To set down here the expanding list of the indications and contraindications for pneumothorax would result in nothing but confusion and error. Of all factors the individual one decides the question, which even then may be doubtful. To say the disease must be strictly limited to one lung, as was taught a few years ago, would be altogether misleading to-day and would deprive some patients of its use, whose life it might save. This much may also be added, to carry out the treatment only a pneumotherapist should be employed, for no one without this training should attempt to put gas into the pleural cavity, a needle in the wrong place has many times spelled sudden death. In the hands of those who know and anticipate every possibility, pneumothorax is entirely free of danger.

The outstanding achievement, to my mind, of this discovery of Forlanini's is that the patient made well by pneumothorax stays well. This is a comforting assurance to the doctor who in former years had to witness, often, the discouragement and heartbreaks of the patient who after a year or two of faithful bed-rest, would break down utterly under the ravages of influenza, a hemorrhage, or some similar disaster, symptomatically he was well, anatomically he could not have been. In 1928, H. Longstreet Taylor opened his presidential address with, "The relapsing character of pulmonary tuberculosis in cases that have been discharged from treatment is both realized and feared by the medical profession." Today, appreciating and utilizing

¹ Schlenker Lawrence. The Importance of Repeated Examination of the Sputum and of the use of the Antiformin Method. Journal of the Mo. State Med. Assoc. 22: 216-218 (June) 1925.

pneumothorax better, we know there is at hand a means for applying exact, controlled pressure upon the ulcerated tissues, the cavities, and the blood and lymph vessels in the diseased lung. This is the logical way for bringing about anatomical or permanent cure. Through this procedure, probably the greatest discovery in the field of curative medicine, more can be accomplished in clearing up the toxemia of tuberculosis in a few weeks than the bed did in months or even years. Fever, sweats, rapid pulse, loss of appetite and malaise soon disappear. At the same time there is steadily being removed from the body a focus of infection of a most serious kind, a mine charged with high explosives, ready on any pretext to flood the opposite lung or other organs with bacilli.

On turning next, to one of the difficult sides of the *behandlung* of a case of tuberculosis, the economic one, there is at once seen the great saving in time and money through the use of pneumothorax. To the average patient this is of tremendous importance, for it often decides the difference between getting actually well and remaining an intermittent invalid as long as he lives. For in taking the patient before long-continued illness has bankrupted his vitality, a satisfactory pneumothorax can cut the duration of his work-disability down to three or six months, compared to the one or more years required by bed-rest. This being known at the start, the employee is encouraged to ask for a definite leave of absence, whereby he can often induce the employer to hold his job open for him. Thus, though continuing under treatment, the breadwinner again takes up his work, the woman marries and perhaps bears children, and the youth resumes his studies towards a career, all leading normal, successful lives. To the pregnant tuberculous woman, pneumothorax has been life-saving, and to the diabetic likewise. Let us then ask, can any other treatment show such complete cure, or any approach to it, in so short a time and at so trivial a cost?

So far, what has been said, concerned only the individual himself. There was no mention of that highly important matter, the public health, which expresses itself here as preventive medicine. It must be obvious to all, that any comprehensive measure which con-

verts the carriers of tubercle bacilli into safe members of the community is important. But it also is unfortunately true, that few of us realize the actual and far-reaching effects upon the common health of a medical measure which can and is performing this miracle. That tuberculosis is declining in both volume and virulence, those in daily contact with the disease will attest. What has brought this decline about, may be divided in uncertain ratio between an increase in the partial immunity to tuberculosis, developed in the civilized white race, and an increase in the use of pneumothorax as a treatment for the disease. At least it is unquestionable, that as the spreaders of infection have been removed, tuberculosis has been proportionately controlled. The patient who no longer expectorates bacilli is of no more danger to his family and associates than is the non-tuberculous one. To the tax-payer, a cure for tuberculosis which can be carried out in the home must be of lively interest, when he learns that every patient in his public sanatoria costs him in the neighborhood of \$1000 a year. And at that, no community has been able to anywhere near catch up with the disease in furnishing hospital beds for its tuberculous citizens. The city of St. Louis, a fair type of all municipalities, has but 884 beds for its 10,000 active cases. Consequently, when more than 90 per cent of a problem must be settled in the home, it is surely a home problem.

Conclusion

In the cure and prevention of pulmonary tuberculosis, pneumothorax treatment has become the really effective weapon, but how well this will be used rests with the family physician, depending upon how early he detects the disease in his patients. His most practical instruments in doing this are the roentgen picture and the examination of the sputum, two measures he should employ early and often, for they are accessible to every practitioner and obtainable by every patient. His final responsibility lies in determining the possibility of employing pneumothorax as the treatment. By so simple and practical a procedure tuberculosis is placed among the perfectly curable diseases and its eradication practically assured.

DISCUSSION

Dr Andrew C Henske

I have enjoyed listening to Dr Schlenker's paper I believe there is no physician in this audience tonight, who is not in full accord with the essayist's views on the importance of early diagnosis in its bearing on the successful treatment of pulmonary tuberculosis

With the exception of cancer, there is probably no disease where successful treatment is so dependent on the degree with which an early diagnosis is made Failure to make an early diagnosis is often fraught with grave consequences to the individual suffering with this disease and to a serious economic loss to society as a whole

It is a well established fact that pulmonary tuberculosis, when unrecognized and improperly treated, may develop from an early lesion to one far advanced within a period of three to six months from the time of its onset On the other hand, an early case when immediately given proper treatment can become a quiescent case within the same period of time, and the patient be permitted to resume his or her occupation provided it is not one of heavy manual labor

An analysis of the admissions to Mt St Rose Hospital during the calendar year of 1937 reveals some interesting facts During this period there were admitted to the hospital 215 patients Of this number there were 19 who were non-tuberculous, admitted for diagnosis and observation The remaining 196 were all tuberculous and came under the following classification

Minimal A-4)
Minimal B-10) —14 or 7 1%
Moderately advanced A-0)
Moderately advanced B-60) 62 or
Moderately advanced C-2) 31 6%
Far advanced A-3)
Far advanced B-50)
Far advanced C-61) 114 or 58 1%
Miliary 1
Terminating —6) or 3 2%

It is evident from the foregoing that by far the greatest percentage of our admissions come under the heading of "Far Advanced" or so-called "Third Stage," namely, 114 or 58 1 per cent In the Minimal or first stage,

there were only 14 or 7 1 per cent These figures tend to show that at least at our institution, very few patients are admitted who come within the classification of Minimal Tuberculosis, the very class from which we expect, under suitable treatment, to obtain the best results with the least amount of impairment

I am fully convinced that these statistics are in no way different from the statistics that one could gather at Robert Koch Hospital or at the Missouri State Sanatorium Formerly the State Sanatorium only admitted early cases and always had many available beds Several years ago the bars were let down and all stages of the disease, except terminating cases, were permitted to enter The result has been that there is today a long waiting list of those who are clamoring for admission This holds true for Koch Hospital and also for Mt St Rose They both have a long waiting list

When we realize, as Dr Schlenker has so clearly pointed out, that the most favorable time for the employment of our most valuable method of treatment, namely, artificial pneumothorax, is only conducive of the best results when the disease is relatively in an early stage, then we can realize how futile our efforts are when cases first begin to receive suitable treatment when they are already too far gone

The average stay of an early case at our institution is not over six months The average stay of a moderate or far advanced case ranges from six months to at least three years or more From this one can easily conclude why there is a constant clamor by our state and city authorities for more beds to take care of our tuberculosis problem This condition would be almost reversed if early diagnosis were the routine procedure

Statisticians tell us that tuberculosis is on the decline Yet, today we have more hospital beds available for this disease than ever before and our waiting lists are longer than ever before

What is the explanation for this state of affairs? The answer, unless I am wrong, probably lies in the fact that the individual physician who first sees these early cases, fails to make an early diagnosis, and even when an early diagnosis is made, fails in his

duty to see that proper treatment is instituted

The National Tuberculosis Association, for over a quarter of a century, has been carrying on a campaign of educating the public. From the public standpoint, this campaign has been successful and has borne fruit. Today, every high school student knows that early diagnosis is the key-stone to the treatment and that rest, fresh air and diet are the methods employed to bring about a cure.

The physician in the field, however, is still the stumbling block, and this has been repeatedly shown by an analysis of case histories of patients admitted in the advanced stage to our Sanatorium.

Unless, as Dr. Schlenker has clearly pointed out, the general practitioner takes proper advantage of the diagnostic laboratory aids that are at his command, this problem can never be solved.

Dr. Louis C. Boisliniere

I know of no one engaged in chest work in St. Louis who has had a greater experience in artificial pneumothorax than Dr. Schlenker, who has done thousands and thousands of "initials" and "refills".

The introduction of artificial pneumothorax by Forlanini was epical. The medical profession in St. Louis and especially the staff at Mt. St. Rose are under a deep debt of gratitude to Dr. Albert Taussig, who was the first to introduce this beneficent procedure to the profession in St. Louis on his return from Europe approximately 25 years ago. He kindly came down to Mt. St. Rose regularly for a period of a number of months and demonstrated it to us. Since that time it has been performed there in ever-increasing numbers. It was some years, however, before it was taken up by the other phthisiologists in our city, due to the natural conservatism in medicine. It has now become so universal a procedure that every medical graduate should be given a fair knowledge of this procedure.

Artificial pneumothorax is not so simple a procedure as one might be led to believe. It has many hazards, which, however, can be reduced to a minimum only by most meticulous care. Therefore, no one should attempt a pneumothorax, unless in a case of emergency, who has not had some training in the

performance of it. A certain Frenchman stated that he never gave a pneumothorax without having in mind the possibility of having a mortality on the table. These mortalities will occur unless every detail of the procedure is carried out in a most precise way, and even then it may occur. At Mt. St. Rose we have had three deaths in the last 25 years among thirty or forty thousand cases. These deaths were all due to air embolism. There are many other minor hazards which experience, in many instances, teaches us how to avoid. "We should all profit by the hints of every new experience."

We must not forget that in many cases the disease may become arrested without the use of artificial pneumothorax. This is evidenced by the fact that most of our greatest phthisiologists now over 45 or 50 years of age are still actively engaged in their work. Artificial pneumothorax has been generally adopted only for about the past fifteen years. Thanks to Dr. Taussig, we were fortunate enough to institute it approximately 25 years ago.

Many cases of active tuberculosis, even with small cavity formation, especially if the lesion is apical, may arrive at a state of arrestment and the small cavities closed by Nature's emplacement of contracting cicatricial tissue, on absolute bed rest and medical supervision.

However, I do not believe in delay. As soon as we are satisfied that the patient has not got this capability and the sputum remains positive and the stethacoustic signs are those of definite activity, an artificial pneumothorax should be instituted.

Although we may think that a patient may get well under Sanatorium treatment alone, nevertheless, the institution of pneumothorax will greatly shorten his stay in the Sanatorium. Therefore, it is justifiable for economic reasons alone to introduce this procedure just as soon as it is indicated.

Dr. Schlenker, closing

To thank Dr. Henske for his interesting statistics is my first pleasure, they should convince us that tuberculosis is still far from being diagnosed and treated early enough. To disagree with Dr. Boisliniere, with his wide experience and fine judgment, would be bor-

dering on heresy, he but inserts the words of calm judgment, which is very proper. What Dr. Boisliniere thinks of the early, active treatment of tuberculosis is shown by the figures from the institution of which he is medical director, Mt. St. Rose Sanatorium, five years ago only 15 per cent of the patients were receiving pneumothorax treatment, today 45 per cent are under some form of collapse therapy. What I am anxious to say is that we are only too prone to let the patient go too long without instituting some active and really effective treatment, through which

the patient may lose his every chance for getting well. We are too easily fooled by appearance and symptoms in tuberculosis. By keeping the patient in bed over a prolonged time he may get fat and look well, and even lose his cough and temperature, but who can tell how completely his lungs are healed out? All that I can say is that I have never been sorry for instituting pneumothorax in any patient it has been given to, but have many times regretted, in seeing the patient some years later, not having spoken more strongly for its use in the beginning.

3515 S Grand Blvd

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Amoebic Abscess of the Lung Complicated by Cerebral Abscess—Report of a Case*

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INVASION of the lung by *Entamoeba histolytica* without liver disease is not common, yet secondary involvement of other organs is even less frequent. According to Armitage¹, amoebic abscess of the brain has been reported in 48 patients, occurring mainly in Egypt. Ochsner and DeBakey², in an excellent review, found that pleuro-pulmonary suppuration followed amoebic infestation in approximately 15 per cent of all cases, more than 14 per cent of which were hematogenous in origin without concomitant liver infection. The rarity of pulmonary lesions with no hepatic affection is recognized when one considers that these occur in less than 3 per cent of all recorded cases of amoebiasis. These authors do not mention the occurrence of metastatic abscess of the brain following pulmonary amoebic abscess, and for that reason the case here presented may be of interest.

Case Report A Grecian male, age 37, presented himself at the Jefferson Medical College Hospital. His history stated that six months previous, while in his native country, he had contracted a dysentery. Although apparently recovered, he later developed chest symptoms enroute to America. On his entry to this country the patient was immediately

hospitalized for six weeks and a diagnosis was made of (1) lobar pneumonia, (2) amoebiasis, (3) amoebic hepatitis. Approximately two months after his discharge, the man was admitted to the Jefferson Hospital medical wards, complaining of left-sided chest and back pain, cough and bloody expectoration of two weeks duration.

At this time bloody expectoration, temperature of 38.5°C (101.4°F), moderate leukocytosis, and physical and roentgen evidence of consolidation in the upper half of the left chest supported a diagnosis of pneumonia. During the next ten days, the temperature ran an intermittent course, and roentgen examinations showed an abscess cavity in the posterior portion of the upper lobe of the left lung (Fig. 1, page 21).

The patient was then transferred to the bronchoscopic service, remarkably little pus could be aspirated from the left upper lobe bronchus by frequent bronchoscopic drainages. Subsequently the pulmonary abscess increased in size and the amount of "chocolate sauce" pus became profuse. At no time after the initial examination was a leukocytosis recorded, but the number of erythrocytes dropped consistently, necessitating the use of several blood transfusions. Blood chemical and serological findings were not notable. Vegetative and cystic forms of *Entamoeba*

* From the Bronchoscopic Clinic, Jefferson Medical College Hospital, Philadelphia, Pennsylvania.

histolytica were recovered from the sputum and watery stools on numerous occasions

Emetine treatment was instituted on the 92nd day of the disease and the formerly irregular fever promptly dropped to normal. The marked improvement in the patient's general condition continued until the 138th day when he suddenly developed a convulsive seizure with a rise of temperature, followed by complete motor palsy of the left face, arm and leg. Roentgen, eye ground and cerebro-spinal fluid examinations were negative. The tentative neurological diagnosis was an abscess in the right motor cortex with meningeal involvement. The patient's condition progressively became worse, and the onset of coma presaged death five days later.

At the autopsy, multiple scarring was observed in the cecum and colon, but no active amoebic lesions could be demonstrated. The upper lobe of the left lung was the seat of an abscess measuring 3 cm in diameter and containing dark brown pus. Chief interest centered on the brain, weighing 1650 grams, and measuring 19x16x9 cm. Located in the left cerebral hemisphere at the junction of

the frontal and parietal lobes near the mid-line was a pointing abscess, 3 cm in diameter. The main pathologic diagnosis was acute pulmonary abscess, amoebic, cerebral abscess, amoebic, and multiple cicatrices of the cecum and colon, amoebic.

Summary

A case of amoebic abscess of the lung of hematogenous origin followed by an acute brain abscess is reported. Clinical and roentgen evidence indicated that by the use of repeated bronchoscopic drainages and emetine therapy the lung lesion was healing satisfactorily, the onset of cerebral metastasis was sudden and caused rapid termination of the patient's life. It is of further interest to speculate on the possibility that an abscess may result from an amoebic pneumonic process.

- 1 Armitage, cited by Manson-Behr P H. *Manson's Tropical Diseases*, Wm Wood and Company, 1936 Tenth Edition, Chap 24 page 520
- 2 Ochsner, A and DeBakey, M. *Plenropulmonary Complications of Amebiasis*, *J Thoracic Surg* 5:225 Feb 1936

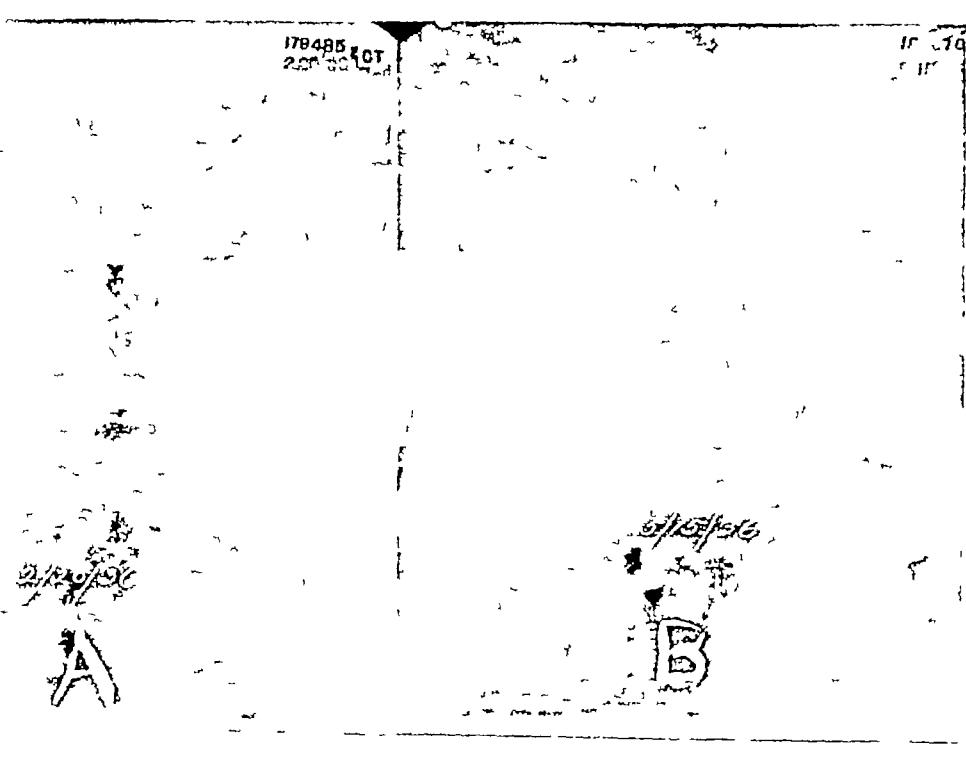


FIG 1

A. Roentgenogram demonstrating a large abscess with fluid level in the upper lobe of the left lung. Area of pneumonitis surrounding this is quite marked.

B. Three months later an air containing cavity is distinctly visible, but the size of the abscess and inflammatory zone surrounding it have diminished.

Teaching Methods in Medicine, or How Effective Is Our Teaching?

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Milwaukee Wisconsin

HAVING been identified with medical education in one capacity or another for more than a quarter of a century, during which time I had ample opportunity to observe our educational efforts as reflected in the work of our students, interns, house physicians, and, finally, as active practitioners of medicine, in the city as well as in rural communities, I gathered certain impressions on medical education, and as time went on they gradually crystallized into definite form

In presenting my views on current medical educational problems, I fully realize the vastness of the subject involved, cognizant of the diversity of opinion of eminent medical educators both here and abroad. Above all, I am deeply conscious of my own shortcomings in this attempt.

And, perhaps, you may well ask, with the "cynic of old" what is my motive in all this? And, apologetically, I must answer that I do not possess "the philosopher's magic stone of wisdom." Nor do I wear the "mantle of a Master Critic." Medical education, more specifically here at Marquette, is my sole and only motive.

What can we do to make our teaching most effective? Do nonmedical teachers know anything about teaching that would be valuable to us in our work with medical students? The philosophy of education, as conducted in the public schools and colleges, has been revolutionized during recent years.

The teacher accepts the pupil not as a recipient, but as a reacting agent. The teacher accepts the pupil as the predominant partner in the work of education, and arrives at a result that shall contain a large contribution from the free activity of his mind. The teacher has now become a director of learning. He stimulates and guides the pupil, who learns largely by self-activity. His mission is to teach pupils, not subjects. The idea that education can be imparted has been abandoned.

John Dewey, professor of philosophy in Columbia University, points out that education is not an affair of telling and being told, but is an active and constructive process. The student's understanding and retention of a subject are commonly so much less as a result of listening to lectures than by pursuing some of the various methods of learning in which self-activity is a feature. In other words, if we follow the spirit of the idea that it is the student who is doing the learning, and we, as teachers, are aiding them by guidance, stimulation, etc., the more sound will be our work as teachers of medicine.

There is no formal teacher training for medicine. The average medical teacher is selected for his superior knowledge of his subject, and much less for an equally sound understanding of the methods of teaching. Someone has said that medical education suffers from a "plethora" of authorities on medicine and a "dearth" of teachers.

Most new teachers of medicine adopt methods and procedures which in their experience were effective during their own education. This, of course, is a practical and often efficient method of entering into the practice of medical teaching. Is it not, however, desirable that medical faculties become familiar with the newer philosophy of contemporary education, and utilize whatever part of it may be applicable?

I do not wish to imply that much of our medical teaching is unsuccessful, far from it! Many able physicians have been graduated, many others have become well educated, in spite of the weakness of pedagogy in schools of medicine.

The problem of what is effective teaching includes, of course, the teacher himself. Let us pause a moment and step in the lecture room and see the teacher in action.

Dr A—Prosperous, splendid fellow, popular with the students, good story teller, never gives a grade below B, lectures from notes that were good at one time, but now very much in need of vitamin A but not D.

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Dr B—A walking encyclopedia of medical facts, does all the talking and most of the thinking for his students, complacently accepts and wears the crown of medical authority, but woe to the student who questions any of his pronunciamientos! (May we label him the "Medical Giant"?)

Dr C—Young, faultlessly groomed, well qualified, capable, enthusiastic, suffering from transient attacks of lecture room megalomania, with an educational delusion that in order to make the proper impression on his students, he must refrain from discoursing on the common and ordinary variety of medical practice, but must soar aloft, until he is lost in that nebulous medical stratosphere where medical visibility is low, and difficult to separate fact from speculation

Finally, Dr D—Modest, honest, tolerant, sympathetic, studious always, remembers his own difficulties while a student, has a definite conception of his obligation to the student as well as to the patient, keeps himself informed of the advances in his field, and sees that his teaching has a freshness so stimulating that carries somewhat into the student, rarely gives an A—if so, it means something

Who can predict the gains that may come in the future, if teachers obtain a sound knowledge of the science of teaching, in addition to that of their knowledge of medicine? Some years ago, an interesting criticism was published by the Commission on Medical Education

First—There is overcrowding in the schedule of work throughout the medical course

Second—Much of the teaching in science courses, both laboratory and theoretical work, does not contribute to a sufficient understanding of the basic sciences upon which intelligent practice of other medical work depends

Third—Too much of the clinical teaching is from the standpoint of the specialist and on rare diseases, and not enough from the standpoint of the needs of most patients

Fourth—The divided responsibility for the care of patients, and the impersonal attitude so frequently taken towards patients in the hospital and clinic, handicap the preparations of students for the assumption of individual responsibility required in practice,

and for the large emotional and psychologic factors in many illnesses

If my information is correct, this does not apply to us here at Marquette, except in some minor instances. How effective is our teaching? How well does our "stuff" go across? These are questions that every medical teacher would like answered. It would be presumptuous on my part to offer a definite answer. It may be well, however, to offer some discussions on the subject

A knowledge of the psychology of learning is important to every teacher. For all practical purposes we may divide these fundamental laws of learning into

- 1 Interest or Motivation
- 2 Attention
- 3 Association or Thinking
- 4 Repetition
- 5 Success

Time will not permit to discuss fully all of these items. Let us examine, however, some of the very essential laws and note in what way they affect our work as teachers of medicine

The Law of Interest or Motivation. Learning is directly effective and efficient in proportion to the interest of the learner. Interest in what is to be learned is so significant in effective learning that it is often wise to defer its study until interest is assured. Interest begets attention, without attention success is unlikely to follow. I think it is safe to say that as teachers, most of us have violated this law only too often. May I quote to you what Dr Irving S. Cutter, dean and professor of medicine at Northwestern University Medical School, has to say in this relation?

"The stimulus and direction given by a wise teacher are often of far greater importance than the subject matter taught. The skilled surgeon is often a poor teacher, largely because of his lack of training in teaching methods under a real clinical leader. Of a given medical faculty, possibly 5 per cent will have natural teaching ability, a large percentage may, however, become excellent teachers through the application of a few elementary principles of pedagogy."

If Dr Cutter's statement be deemed true, what steps are being taken to remedy the difficulty?

Some of you may say that experience is

the most important factor in the development of skill in teaching Let us not forget that experience without insight is an inefficient means of learning anything It has been said "Experience is a good teacher, but it charges a high rate of tuition"

The Law of Association or Thinking It is said that every student comes under the influence of the famous Dane, Frederik Grundvig, Denmark's great educator (although the latter's name is unknown to him) Grundvig's theme was simple Too many books, too much doing, too much writing, too little thinking "What we learn from books is valuable only when we do something with it What we do is valuable only when we know why we are doing it" At first thought, this sounds like a revolutionary statement However, the more one reflects on it, the more illuminating it becomes How much of Grundvig's philosophy is applicable to us here I leave to your own individual judgment

The Law of Repetition "The student can absorb and retain only a small portion of his course Facts as isolated facts, unless correlated, are lost Teaching in too great detail, to the exclusion of giving a broad conception of the fundamental principles, is educational homicide" Learning inevitably takes place when the student faces problem situations repeated at intervals It is normal to forget About 50 per cent is forgotten, or relegated to our subconscious mind, in a few months The really important facts can be relearned by repetition

Considerable attention is being given of late to the correlation of the various subjects pertaining to medical education The graduate in medicine must always remain a student, if not, he will prematurely arrive at that stage of "mental fixation" where progress ceases It is sad to see so many medical brethren, yes, even some of our bright and promising young graduates, succumb to this insidious affliction It has been my belief for some time that we, as teachers of the clinical subjects here at Marquette, have not paid enough attention to the correlation of especially the four great cornerstones of medicine *Anatomy, Physiology, Chemistry and Applied Pharmacology*

Anatomy is essentially the foundation of medicine, it is necessary to the understand-

ing of physiology, pathology, medicine and surgery, and at every point should be correlated with those subjects Only too often do students hear little or nothing of gross anatomy after they leave the anatomical laboratory

While the formal course of physiology may end with the second year, the teaching and application of physiology to medicine must be continuous and serious, with the teacher of medicine as interpreter of pathologic physiology

It is needless for me to mention the correlation of that so stimulating, but oh! how often humiliating, subject of pathology As William Osler so well said, "*As is our pathology, so is our practice*"

It is my firm conviction that these subjects should be correlated not in the lecture room, but at the bedside, in the operating room, in the dispensary Strange to say, there are some clinical men who openly advocate placing these in water-tight compartments, unmolested, and there calmly awaiting the day of judgment

To strengthen my position in this matter, may I quote Dr Jonathan Campbell Meakins, professor of medicine in McGill University, Montreal He writes "It is not the function of the physiologist or of the biochemist to teach so-called pathological physiology or pathological biochemistry These subjects essentially fall within the realm of clinical medicine, in fact they are medicine—and the staff of a department of medicine, at the present day, which cannot undertake this teaching is not equipped properly"

Just as long as we clinical teachers ignore the correlation of applied pharmacology, its clinical value in the treatment of disease as well as its limitations, just so long will our graduates continue to be gullible victims for the glib pharmaceutical salesman

The Law of Success, or, by some called The Law of Effort Skillful use of the practice of letting the student note his progress, or success, may result in a continuance or even an increase in his efforts to better the result A kind word, a sympathetic attitude toward the student who has difficulties, will often yield a handsome educational dividend A striking example of this we find in the student

(Continued to page 28)

JOHN BROMHAM HAWES, 2nd

1877 - 1938

IT IS with a sense of infinite loss and a quiet acceptance of the inevitable that we announce the passing of John Bromham Hawes 2nd on July 20th.

Dr Hawes was born at Montclair New Jersey July 11 1877 He graduated from Harvard Medical School in 1903 and a year later began practicing medicine at Boston This practice he continued for 34 years truly becoming one of Boston's beloved physicians Many honors as well as much responsibility came his way About twenty years ago he was made the secretary of the State Tuberculosis Commission of Massachusetts Shortly after Dr Hawes was placed in charge of the clinic for non-pulmonary tuberculosis at the Massachusetts General Hospital He served in both positions with distinction

At the time of his death in addition to his extensive private practice Dr Hawes held the position as consultant on diseases of the lungs to the U S Veterans Bureau medical director of the Rutland Cottage Sanatorium and President of the Boston Tuberculosis Association In connection with the latter, he was instrumental in the growth of the Prendergast Preventorium and in the establishing of the Boston Workshop a subsidized rehabilitation project for the tuberculous

Dr Hawes was a prolific writer both on the subject of his specialty and its relationship to the patient He pub-

lished a total of six books the first in 1913 and the last in 1936 and he contributed many scientific papers for numerous medical journals

He was a member of the American Clinical and Climatological Association the National Tuberculosis Association and a Fellow of the American College of Chest Physicians He was very active in the College and at the last election of the American College of Chest Physicians held at San Francisco in June Dr Hawes was elected a Member of the Board of Regents He served as an Associate Editor of the Journal, Diseases of the Chest from January 1936 up until the time of his death

While these honors were deserved it is not from them that we draw on the fount of our recollections of Dr Hawes Rather we remember him in the relationship of doctor to patient Ever gentle ever thorough, he was imbued with a desire to serve His credo of practice as he himself stated was that At all times it is important to bear in mind that one is dealing with a human being worried and apprehensive and not with merely a case of tuberculosis

His life was full Work and pleasure and the reward of achievement filled it to the brim He has left behind him a monument of human lives and hopes Surely, the world profited by his existence

Thank You, Doctor!

Thank you for making the Hotel Sir Francis Drake your convention headquarters in San Francisco, and for the real pleasure we found in meeting and serving each of you

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Organization News

College Elects Governors

The following Governors were elected at the annual meeting of the American College of Chest Physicians held at San Francisco, California, June 12th Sixteen Governors were elected for a term of one year each Their tenure of office will expire June, 1939 Sixteen Governors were elected for a term of two years, and sixteen Governors were elected for a term of three years

The Governors will cooperate with the Board of Regents in passing upon applicants for Fellowship in the American College of Chest Physicians and they will assist the committees of College in carrying out the program of the College in their respective states

Dr L O Davenport, Birmingham, Alabama, 1939
 Dr Chas S Kibler, Tucson, Arizona, 1941
 Dr J D Riley, State Sanatorium, Arkansas, 1941
 Dr Wm C Voorsanger, San Francisco, Cal., 1939
 Dr Charles I Kaufman, Denver, Colorado, 1941
 Dr David R Lyman, Wallingford, Conn., 1939
 Dr Lawrence D Phillips, Marshallton, Del., 1940
 Dr Joseph W Peabody, Washington, D C., 1941
 Dr M Jay Flipse, Miami, Florida, 1941
 Dr Cleveland D Welchel, Gainesville, Ga., 1939
 Dr O F Swindell, Boise, Idaho, 1941
 Dr George Thomas Palmer, Springfield, Ill., 1939
 Dr James H Stygall, Indianapolis, Indiana, 1940
 Dr John H Peck, Oakdale, Iowa, 1940
 Dr Forrest L Loveland, Topeka, Kansas, 1939
 Dr Edward J Murray, Lexington, Kentucky, 1940
 Dr Morrell W Miller, New Orleans, La., 1939
 Dr Edward A Greco, Portland, Maine, 1941
 Dr Wm A Bridges, Towson, Maryland, 1941
 Dr Julius G Kelley, Pocasset, Mass., 1939
 Dr John Alexander, Ann Arbor, Michigan, 1941
 Dr Sidney A Slater, Worthington, Minn., 1939
 Dr Wesley J C Wlemers, Sanatorium, Miss., 1939
 Dr Hyman I Spector, St Louis, Missouri, 1939
 Dr Frank I Terrill, Deer Lodge, Montana, 1940
 Dr John F Allen, Omaha, Nebraska, 1940
 Dr Robert B Kerr, Manchester, N H., 1940
 Dr Byron M Harman, Verona, New Jersey, 1939
 Dr LeRoy S Peters, Albuquerque, N M., 1940
 Dr Edward P Eglee, New York City, N Y., 1939
 Dr Karl Schaffle, Asheville, North Carolina, 1941
 Dr Joseph C Placak, Cleveland, Ohio, 1941
 Dr Robert M Shepard, Tulsa, Oklahoma, 1940
 Dr James Marr Bisaillon, Portland, Oregon, 1940
 Dr Jacob Paul Frantz, Clearfield, Penn., 1940
 Dr U E Zambarrano, Providence, R I., 1940
 Dr William Atmar Smith, Charleston, S C., 1940
 Dr William S Rude, Ridgetop, Tennessee, 1939
 Dr Orville E Egbert, El Paso, Texas, 1941
 Dr Raymond J Friel, Salt Lake City, Utah, 1939
 Dr Dean B Cole, Richmond, Virginia, 1941
 Dr Frederick A Slyfield, Seattle, Wash., 1941
 Dr Walter E Vest, Huntington, W V., 1941
 Dr Andrew L Banyai, Wauwatosa, Wis., 1940

Dr William F Leslie, Honolulu, Hawaii, 1939

Dr Miguel Canizares, Manila, P I., 1940

Dr Jacob Smith, Rio Piedras, Porto Rico, 1940

Dr Donato G Alarcon, Mexico City, Mex., 1941

Dr Peers Heads Committee on Sections and Section Work of A M A

Dr Robert A Peers, Colfax, California, a Fellow of the American College of Chest Physicians was Chairman of the important committee on Sections and Section Work of the San Francisco meeting of the American Medical Association

In his report to the House of Delegates Dr Peers presented for the committee a recommendation that, "To further the attendance at the general scientific meetings and section programs, your reference committee would be happy to endorse any activity of the Council on Scientific Assembly that would discourage independent societies from holding meetings during the sessions of the American Medical Association"

SOCIETY NEWS

Dr Arnold S Anderson, St Petersburg, Florida, a Fellow of the American College of Chest Physicians, was one of the speakers on a symposium on tuberculosis given under the auspices of the Pinellas County Medical Society, June 3rd

Dr Ross E McPhall, Lakeview, Washington, a Fellow of the American College of Chest Physicians, addressed the Gray's County Medical Society, Elma, Washington on May 18th The title of his paper was "Indications and Contraindications for Thoracotomy"

Dr James H Stygall, Indianapolis, Indiana, Governor of the American College of Chest Physicians for the State of Indiana, addressed the Henry County Medical Society, Newcastle, Indiana He spoke on "Artificial Pneumothorax in Tuberculosis"

Dr Louis Clerf, Philadelphia, Pennsylvania, a Fellow of the American College of Chest Physicians, was a guest speaker before the seventy-first annual meeting of the West Virginia State Medical Society held at White Sulphur Springs, July 11-13 Dr Clerf spoke on "Pulmonary Supuration"

Dr John F Allen, Omaha, Nebraska, a Governor of the American College of Chest Physicians for the State of Nebraska, has been selected as a member of the Tuberculosis Committee of the Nebraska State Medical Society His term of office will expire in 1944

(Continued to page 28)

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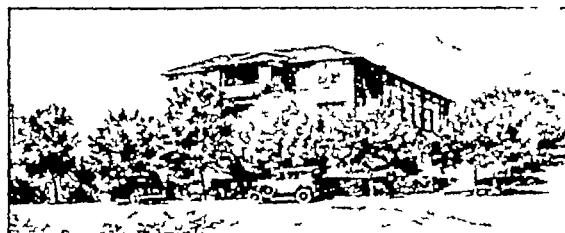
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C. E. ATKINSON M.D.
MEDICAL DIRECTOR

ORGANIZATION NEWS (Continued from page 26)

Dr R B Homan, Sr, El Paso, Texas, a Fellow of the American College of Chest Physicians, was appointed Chairman of the Tuberculosis Committee of the Texas State Medical Society

El Paso Fellows Meet

A meeting of the El Paso Fellows of the American College of Chest Physicians was held July 15th at the Hilton Hotel, El Paso, Texas. Drs C M Hendricks and A D Long gave a report of the Fourth Annual Meeting of the College held at San Francisco, June 12th. Dr R B Homan, Sr outlined his plans for the program of the Tuberculosis Committee of the Texas State Medical Society

Those present were Drs Orville E Egbert, newly elected Governor of the College for the State of Texas, R B Homan, Sr, R B Homan, Jr, C M Hendricks, J W Laws, and A D Long

Founder of the Stony Wold Sanatorium Succumbs

Mrs Elizabeth Wilmot Newcomb, founder and first president of the Stony Wold Sanatorium, Lake Kushaqua, New York, died May 30th, at the age of 78. Mrs Newcomb was instrumental

in raising funds to build a Cottage at the Trudeau Sanatorium, Saranac Lake, New York, but on the advice of the late Dr Edward L Trudeau she purchased and remodelled as a sanatorium an old country hotel at Lake Kushaqua. It was incorporated as the Stony Wold Sanatorium in 1901 and it has been functioning ever since as a sanatorium for girls. Dr Harvey B Powers is the medical director. Several of the Fellows of the American College of Chest Physicians had at one time or another served on the staff of the Stony Wold Sanatorium

State Tuberculosis Sanatorium Planned for Utah

Eber F Piers, Ogden architect, has submitted plans for the building of a State Tuberculosis Sanatorium in Utah. The plans have met with the final approval of the Board and construction will start during the summer. The plan provides for a 100 bed sanatorium, and the buildings will be of frame construction with a concrete foundation. It is hoped to have the sanatorium completed by the end of this year

TEACHING METHODS IN MEDICINE (Continued from page 24)

life of Sir James Mackenzie, father of our present day conception of cardiology

Dr Mackenzie had difficulty in memorizing, and in his preclinical years found it difficult to pass tests when pure memory was required. He became discouraged, considered himself a dunce and ready to give up. Dr Brown, associate professor of anatomy, came in contact with him in the dissecting room, noticed and sensed his difficulties. Through his encouragement and guidance, Mackenzie successfully finished his first two years' studies. When he got into the clinical branches, his troubles were over. His career as a physician, investigator and writer forms one of the brightest chapters in medicine of the present era.

I want to make a suggestion to the Executive Faculty that, if in their opinion it is wise,

during this coming college year, they invite some noted educators who will lecture to us on applied pedagogy and techniques of teaching—one of these to be a nonmedical man.

In appreciation of your kind forebearance, may I leave with you as a gift, for future meditation, a quotation, which I slightly paraphrased, taken from that charming poem, "To a Louse," by Scotland's favorite poet, Robert Burns

"O wad some power the giftie gie us,
To se ousrels as students see us
It wad frae mony a blunder frae us"

Reprinted from the Journal of the Association of American Medical Colleges, July, 1938, Vol 13, No 4

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E. W. HAYES, M.D., Medical Director

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Volume I

Number 9



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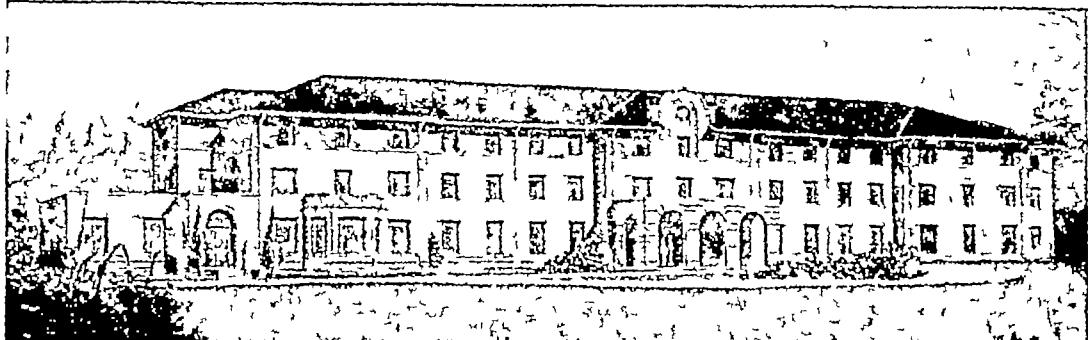
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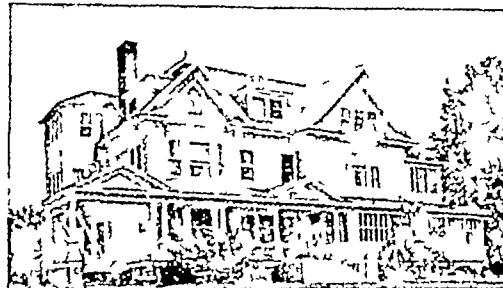
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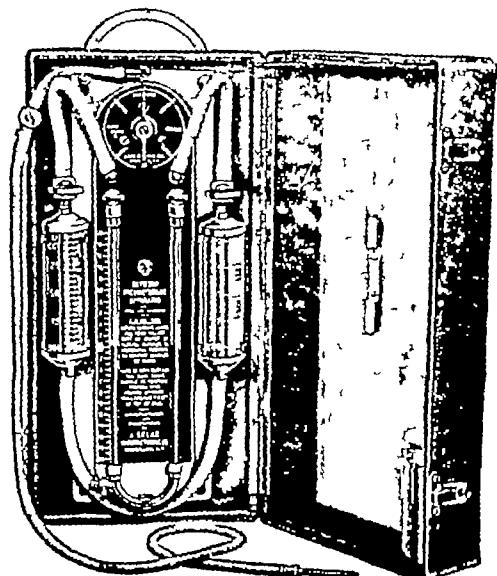
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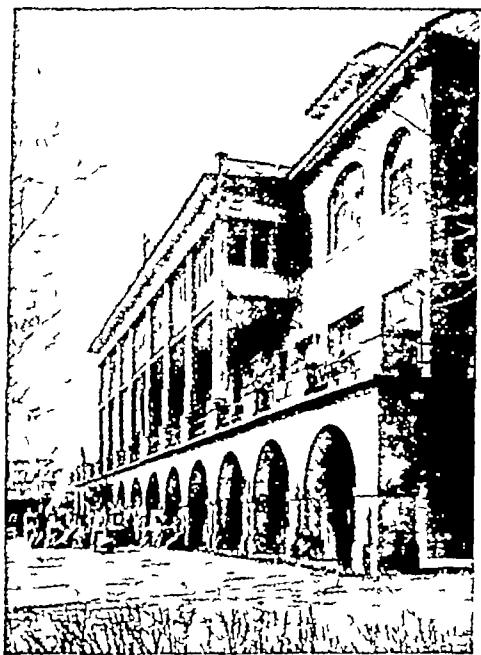


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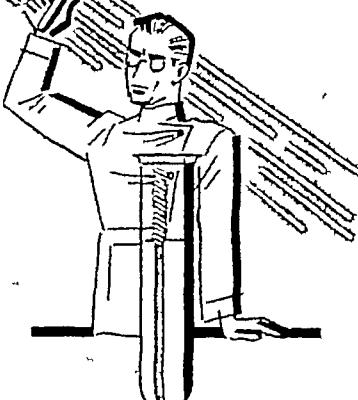
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 Business Address P O Box 1069, El Paso, Texas
 MEMBER ASSOCIATED EDITORS OF TUBERCULOSIS PUBLICATIONS



(A MONTHLY PUBLICATION)

Subscription United States and
 Canada \$2.00 per year Other
 countries \$2.50 per year
 Entered as second-class matter
 August 18 1936, at the post office
 at El Paso Texas, under the Act
 of August 24, 1912

Editorial Comment

SUCCESSFUL MEETING The fourth Annual AT SAN FRANCISCO Meeting of the American College of Chest Physicians (formerly the Federation of American Sanatoria) has passed and it is now history. Much has been accomplished during its short life, much needs to be done

The College has shown a healthy growth in its membership during the past year, and the Officers and Fellows of the College face the future with hope and encouragement.

All of the Sessions were well attended and the committee reports and scientific papers were enthusiastically received.

The American Medical Association with whom the American College of Chest Physicians affiliates has made a new departure from its customary procedure by naming the cities for its annual meetings three years in advance. St Louis, Missouri, was accorded the meeting for 1939, New York City for 1940, and Cleveland, Ohio, for 1941. We trust that the Fellows of the American College of Chest Physicians will make plans to attend all of these meetings.

F W B

COLLEGE ELECTS Dr Ralph C Matson, OFFICERS Portland, Oregon, was elected as the President

Elect of the American College of Chest Physicians at the Fourth annual meeting of the College held at San Francisco, June 12th

Dr Champ H Holmes, Atlanta, Georgia, who was elected as President Elect last year at Atlantic City was inducted into office as President. He succeeds Dr Edward W Hayes, Monrovia, California.

Dr Benjamin Goldberg, Chicago, Illinois, was elected First Vice-President and Dr Willard B Soper, New Haven, Connecticut, was elected Second Vice-President. Dr Robert B Homan, Jr, El Paso, Texas, was re-elected Secretary-Treasurer.

Dr Frank Walton Burge, Philadelphia, Pennsylvania, was re-elected as the Chairman of the Board of Regents for four years.

The members elected to the Board of Regents and to the Board of Governors will be announced in a future issue of *Diseases of the Chest*

C M H

PRESIDENT'S ADDRESS*

American College of Chest Physicians

EDWARD W HAYES, MD, FACP **
Monrovia California

Inasmuch as this is a relatively new organization, still going through the formative period, I feel that it is fitting that I should confine my remarks at this time to the development of the organization as it has taken place so far and to the purposes of the organization as they exist at the present time.

This organization came into existence approximately three years ago. Primarily, it was composed of physicians engaged only in private sanatorium work. As I understand it, the organization, at its inception, had two main objectives. The first was to bring about a closer association in tuberculosis work of the men in the general practice of medicine with those specializing in diseases of the lungs. The second objective was to emphasize the importance and the value of sanatoria, in general, in the treatment of pulmonary tuberculosis, and particularly to emphasize the place of private sanatoria in caring for those cases of tuberculosis who, because of their financial status, were not eligible to and, according to the principles guiding the practice of medicine in this country at the present time, should not be cared for in tax supported institutions.

Inasmuch as the membership of the original organization was limited to those physicians connected with private sanatoria and inasmuch as one of its objectives was to emphasize the place of the private sanatorium, the organization exposed itself to the criticism of being selfish in its motives. Although I had no part in the launching of the organization, I had, for a long time, shared the feeling that there was in those phases of the tuberculosis work, which have to deal with its medical aspects, need for an organization composed entirely of physicians. The motives

of such an organization must, however, be unquestionably altruistic.

In medicine, as a whole, and in any branch of medicine, it is the practicing physician who alone appreciates and who alone understands many of the practical problems which arise, and, because of this understanding, it is he alone who is able to work out the solution of these problems. It has not been the idea of its members that this organization should, in any way, supplant, but rather that it should supplement the National Tuberculosis Association and other tuberculosis associations in their activities, which are purely medical, in coping with the tuberculosis problem.

The outgrowth of these various circumstances was that the organization definitely decided at the Atlantic City meeting last year to limit its purposes to assisting, wherever possible, in bringing about conditions whereby the man in the general practice of medicine will be in a position to fit more efficiently into the picture. To do this, our efforts must necessarily be directed along different lines.

In line with this same course of action, it was also decided at Atlantic City that, instead of limiting the membership to physicians connected with private sanatoria, membership in the organization should be open to the many physicians who are connected with public sanatoria or who are not connected with sanatoria at all, as well as those engaged in other phases of tuberculosis work, such as research or teaching. At the same time, the name of the organization was changed from The Federation of American Sanatoria to The American College of Chest Physicians, which it was felt would be all inclusive.

During the past year the organization has grown rapidly. For the present, it was thought best to limit our membership to 500. To be acceptable, applicants must, of course, be reputable physicians and at least twenty-

* Delivered at the Fourth Annual Meeting of the American College of Chest Physicians held at San Francisco June 12, 1938

**Retiring president of the American College of Chest Physicians

nine years old. They must have been in the practice of medicine or teaching or research work for five years, during which time the major part of their work must have been devoted to some phase of tuberculosis or other diseases of the lungs.

Originally, one of the methods by which the organization attempted to reach the general practitioner of medicine was by the publication of our journal known as *Diseases of the Chest*. This publication attempted to bring to the man who is already out in the field of general practice, the practical side of the purely medical problems involved in the handling of tuberculosis. This journal has had a wide circulation, which is gradually increasing. Over 400,000 copies have been sent out and, as far as we are able to learn, it is being well received, and we feel it is at least tending to keep the man in general practice tuberculosis conscious. At the present time, the continuation of this journal is one of the main objectives of the organization.

A number of the county and other tuberculosis associations are now purchasing group subscriptions to this journal. They are permitted to do this at cost and these associations, in turn, are giving them gratis to a selected group of physicians in their communities. We hope that more tuberculosis associations will see fit to make this same or a similar effort in distributing this journal.

As a second objective or line of endeavor, during the past year, the organization has instituted as part of its program the bringing about of a more widespread appointment of special committees on diseases of the lungs in the various county and state associations. Already, in some of our eastern states, considerable has been accomplished along this line and the way in which this work has been received indicates that it will become much more extensive in the next few years. The object of these committees is to increase the number of talks and papers on phases of tuberculosis pertaining to the work of the general man, in the programs of medical associations, county, state and national, as well as to increase the number of educational demonstrations and clinics and postgraduate work available to the man in general practice. Since its inception, this organization has endeavored particularly to increase the num-

ber of papers pertaining to diseases of the lungs on the programs of the American Medical Association meetings.

In addition, it is very strongly felt by the members of this association that if our efforts in soliciting the interest and efficient co-operation of the general man are to attain the desired results, something should be done to reach the future doctor before he has completed his undergraduate medical education and gone out to take up the burden of earning a livelihood and establishing himself in practice. As a rule, unless, during his medical school education, the student has been given a workable understanding of tuberculosis as a disease, it is too late, after he has graduated and become established in practice, for him to be able to obtain the necessary knowledge and understanding. He is then too busy with too many other things.

Consequently, the third objective of this organization is to lend assistance in furthering the movement to establish a somewhat uniform and efficient undergraduate teaching of the diagnosis and treatment of tuberculosis in our medical schools, a system wherein the graduating student will have been taught not only to think intelligently regarding the diagnosis of tuberculosis, but also to think intelligently in regard to the modern treatment of this disease.

The late Lawrason Brown very wisely said, "The failure to diagnose tuberculosis is very often the failure to think about the disease." And I feel I can truthfully add that today, perhaps more serious errors are made in advice to patients regarding treatment after the diagnosis is made than are made in connection with the diagnosis.

A survey made by the Statistical Committee of this organization one year ago in regard to the undergraduate teaching of diseases of the lungs in all the medical schools in the United States revealed that in 57 out of the 66 schools that took enough interest to reply to the questionnaire, there were eleven in which there was no one on the faculty specializing in diseases of the lungs. It also revealed that about half of the teaching of diseases of the lungs in the various medical schools is being done by men other than those specializing in this field. I very much doubt if any major specialty, regardless of its mor-

tality or morbidity rate, is handled in such an unsatisfactory manner in our schools

I need not express to this group what a handicap a situation such as this creates for the oncoming doctors on whose shoulders is going to rest, to a large extent, the solution of our tuberculosis problems Many of these men are going out into the field of practice with the same understanding of diseases of the lungs that you and I had, and in my own case, that understanding was about equal to what it was when I graduated from academic college Incidentally, today, my class is celebrating the twenty-fifth anniversary of our graduation back in Minneapolis

After five years in general practice in a small midwest town, with a typical picture of pulmonary tuberculosis, including a recent hemorrhage, I went back to Minneapolis to consult what I considered the most outstanding of my teachers in this line I was told I had the "flu" and that I could go back to work in a week or two Had it not been for a chance circumstance that placed me in the hands of a man who had had tuberculosis himself and who, consequently, was well qualified in the diagnosis and treatment of the disease, I would have been sent away for me and my family to join that tragic parade, which perhaps is not quite so large as it was twenty years ago, but is still large enough to be appalling, and which still passes before your and my ears and eyes practically every day

A small proportion of our medical schools at the present time have excellent systems for the teaching of diseases of the lungs, but, in many instances, this subject is not taught very much more efficiently than it was twenty-five years ago As one having worked for the past sixteen years in an institution that has a large number of internes that are drawn, more or less, from all over the United States, it is interesting to note how those coming from schools with efficient teaching facilities stand out in their ability to think in relation to the diagnosis and intelligent treatment of tuberculosis

It is no doubt true that all branches of medicine are clamoring for more time and more efficient teaching in their special lines in medical schools In considering tuberculosis, however, we must remember that we are dealing with a disease that is almost

entirely preventable and a disease that is the most curable of all chronic diseases, yet which today causes more deaths during the productive period of life than any other disease, to say nothing of the additional great loss of time and money and the suffering caused by the disease as it is now allowed to go on

During the past year, I have discussed this situation, mostly by correspondence, at some length with Dr Zapffe, secretary of the Association of Medical Schools He said that he realized the situation in undergraduate teaching of diseases of the lungs, in many instances, is not good and that it is the fault of the teachers and the system, or lack of system, used in teaching, and that he, as secretary of the Association of Medical Schools, would welcome a plan whereby this situation could be rectified

It is not particularly the allotment of more time that we need in the curricula of our medical schools for the adequate teaching of tuberculosis or diseases of the lungs, but, as Dr Zapffe pointed out, the first thing we need is teachers, not only with a teaching knowledge of the subject, but with ability to teach The second thing we need is a comprehensive teaching system, because it goes without saying that, without system, the efforts of any teacher, regardless of his qualifications, are of little avail Yet what a large proportion of the teaching of chronic diseases of the lungs in many of our medical schools is done in a hit or miss manner today To meet this condition, there is an opportunity for associations interested in tuberculosis work to create situations where good teachers must and will be supplied and where efficient teaching will be carried out

In an attempt to accomplish this third objective, at the beginning of the year, this organization appointed a committee on undergraduate education in medical schools The National Tuberculosis Association, this year, also has a committee on this subject Inasmuch as this organization recognizes the National Tuberculosis Association as the parent organization and wishes, as far as possible, only to supplement the work of the National, the activity of our committee was held in abeyance, awaiting action on the part

(Continued to page 24)

The Care of the Tuberculous Patient After Leaving the Sanatorium

JOHN B HAWES, II M.D.
Boston Massachusetts

I am a firm believer in the sanatorium treatment of tuberculosis I am sure that every tuberculous patient, if humanly possible, regardless of race or creed or of social or economic status, should spend some time at least in an institution devoted to the treatment of this disease Old age is almost the only contraindication Of this I am certain

But—and this is very important—I likewise believe that perhaps the most vital part of the role played by the sanatorium comes before the patient enters, which means early recognition of the disease, and likewise, *after* his departure from its sheltering walls which means prolonged and intensive aftercare It is of the latter that I am dealing with here

I was once asked by the secretary of the Boston Tuberculosis Association "Dr Hawes, for how long a time after their discharge from our preventorium should our 'aftercare' worker continue to visit our children in their homes?" My answer was prompt and decisive "Until they die of old age or from some other cause!" This applies to adults as well as to children If we are going to make a sound investment of the millions that have been spent in sanatoria and their equipment we must do a complete job, if we are aiming not only to prolong lives but to make useful and self-supporting citizens out of these ex-consumptives we must realize that their stay in an institution is a part, and a minor part, of treatment, the most important phase of which comes later

How seldom is this realized by either patient or his physician! John Jones leaves the "san" plus twenty-five or thirty more or less useful pounds and a normal temperature and pulse, only too anxious to forget the past and to make up for lost time His physician at the institution, usually overworked and too often drowned in routine, bids him godspeed and admonishes him to take care of himself and not to work too hard, and to report regularly to his family physician Often a more or less perfunctory letter is sent to the local

board of health and perhaps to his physician which is too soon forgotten and placed on file And then six months or a year later the same patient again applies for readmission in worse condition than he was before

This is no exaggerated picture but represents something that is happening every day all over this country I do not say that all of these relapses can be prevented and that the tragedies that go with them are unnecessary ones But I do maintain that many of them are preventable if we only take proper steps to prevent them The question is What are these steps?

It is obvious that much of the work must be done while the patient is still in the sanatorium Time and time again I tell patients, who quite properly insist on having full details as to what they must do in the immediate future, that I am far more concerned with their condition one, five or ten years from now than I am as to how they will be one or two months hence If every physician in our sanatoria would be not less concerned with the immediate effects of lung collapse or the question of doing a phrenic or of taking out some ribs, but certainly *more* interested in the patient's condition years hence, our results would be better "Where there is no vision the people perish," said Solomon If every sanatorium had a nurse, social worker or at least some understanding person whose duty it was to talk at length, intimately and in detail with the patient, not once but many times during the month or so prior to his discharge and to explain to him that he was about to enter what I call "the danger period of treatment," namely, the first six months or year after his discharge, our relapses would be fewer I have sent dozens of patients to Saranac Lake during the past twenty-five to thirty years and I hope and believe that every doctor there is a warm personal friend of mine My only criticism of Saranac is that my patients return, usually full of health and vigor but not what I

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Final / 9

would call properly educated as to how they must conduct themselves during the months subsequent to their departure. They are altogether too unaware of the dangers that will beset them during this period.

It is interesting to trace the development of our efforts to better this state of affairs. As it was Massachusetts that opened the first state sanatorium in this country and was thus a pioneer in the rational treatment of tuberculosis, perhaps a brief description of what we have done and tried to do in this direction and where we have failed will not be amiss.

Back in 1907 we had one and only one state sanatorium. It was then decided to build three more and in other ways to try to put our commonwealth on a better footing as far as tuberculosis was concerned. I was appointed secretary of the commission to do this work which position I held with a more or less constantly changing board of trustees for the next fifteen years. We built and opened three new sanatoria and felt quite proud of a job well done. I, having charge of admissions to these institutions, soon noticed that old patients were applying for readmission almost as fast as new ones were trying to get in. It was evident that something was wrong. We then began sending our "discharge letters." When a patient left any one of our four sanatoria the superintendent wrote a letter giving certain important facts, among which were the patient's condition at entrance and discharge, presence or absence of bacilli in the sputum, his attitude toward treatment along with recommendations for the future. This letter went to the patient's doctor or to the nearest clinic and to the local board of health. As hundreds of these letters had to be written they were perforce more or less brief and perfunctory but they did a certain amount of good at least.

Much more remained to be done. At that time local public health nurses to do home visiting in tuberculosis and to help and instruct these men and women so recently deprived of the close and watchful care of the sanatorium, were conspicuous by their absence. Our board tried to fill this gap by appointing one woman whose gigantic task it was to visit every patient as soon as possible after his or her discharge. As these pa-

tients came from towns and cities all over the state her job was a difficult one. Gradually, however, as local health nurses were found who could cope with this problem her task became easier and she was able to cross off from her list an increasing number of localities. This system is now in existence in Massachusetts and has developed amazingly. We now have four state sanatoria and a magnificent group of seven county institutions along with several high-grade local hospitals for tuberculosis, each with its own out-patient department to which patients are urged to return for frequent check-ups while some have their own corps of nurses to do home visiting and follow-up work. From the point of view of state and municipal control the system is an admirable one and is at present working well. I am doubtful as to how long this improvement will continue, however, because of one grave fault which, unless remedied, will always militate against good results. This fault is that it does not include in its workings, in my opinion at least, the most important factor of all, namely, the general practitioner.

No one can deny that Massachusetts has made tremendous strides in handling tuberculosis, more so perhaps than any other state. It has spent millions upon millions in wonderful palatial institutions. The cost per bed of the four modest sanatoria our commission opened in 1909 and 1910 was \$750. The cost of our Middlesex County Sanatorium, opened some four or five years ago, was \$6000 per bed and that of Worcester County Sanatorium, a later one, \$10,000 per bed! Our state Health Commissioner, whom the City of Detroit borrowed from us and who has now returned to the land of his birth, has openly stated that tuberculosis is a "public health problem, pure and simple" and three times in the year 1936 he stated at public meetings at which I was present that there would be "no tuberculosis in fifteen years!" I hope it will be true but doubt it for the simple reason I stated above—the great inherent fault in this or in any other similar state or federal system—the general practitioner is left out. In its ultimate analysis it is the general practitioner upon whom the burden of after-care must rest. It is he who will and should be called upon to give advice and counsel to

these men and women who often somewhat bewildered by their newfound freedom are urgently in need of practical information on such vital matters as occupation, exercise and rest, diet and, particularly, how to safeguard others at home. It is this subject that I propose to discuss in some detail here.

Let us suppose then that to one of you, a general practitioner, for I am not talking to sanatorium men nor to health officials, comes a patient, John Jones, who has recently been discharged from a sanatorium. He has a wife and children to support. You will at once place him in one of three groups:

- 1 Those who are still clinically sick and who still require intensive treatment
- 2 Convalescents who are more or less up and around but for whom work in the immediate future is out of the question
- 3 Those whose disease is sufficiently arrested to permit them to go to work at once

Those in the first group I will not discuss. They belong in bed.

The second class made up of convalescents is a difficult and important one. In the first place, I would urge that you get acquainted with your patient or renew your acquaintance with him. Sit down and talk with him frankly. Do not hurry. Warn him as to the dangers that will surround him. Insist that he report to you regularly at least once a month and see that he or someone in his family gets in touch with you once a week by telephone or in writing as to how he is getting on. The need of such periodical visits must be made absolutely clear. The patient must be made to understand their vital importance. No matter how well he may feel, and how free from symptoms, these visits must not be neglected. If he does not show up, send for him. Finances must not stand in the way. If the patient is indigent, clinics are usually available. I use a printed form for a weekly report on which temperature and pulse observations, hours of physical and mental exercise, and amounts of rest, coughing, raising, eating, sleeping, are recorded. These reports fill in the gap admirably for those to whom a weekly visit would be a hardship.

If the patient is of a very low mentality, or of a type that knows it all and simply will not cooperate, your hands are tied. Try and

see that at least he does not infect others but do not waste too much time and energy on him otherwise I quite agree with the late Sir Marcus Paterson of London who, when discussing this subject, said to me "Dr. Hawes, there are two classes of tuberculous patients who will never get well and whom I will not treat—alcoholics and damn fools—you know!" After many years of experience I have met with few alcoholics and, I must admit, very few men and women whom I could not persuade to try and do the right thing if put up to them in the right way.

Don't let your patient put all the burden on you. Let him know fairly and squarely that his future lies in his own hands and that it is what lies under his head that counts—brains. Tell him that he must learn to be a "no" and not a "yes" man. Explain to him the meaning of the term, "benevolent selfishness" and that he simply must look after his own health and welfare first and foremost if he wishes to conquer his disease.

Next comes the question of protecting others in the family. Let the patient understand that no matter how long and how many times the sputum has been negative, it *may* become positive at any time especially following any cold or grippe and that at all times the greatest care is essential. Sleeping in a room alone is best and certainly one with no children. Tell him to keep the children out of his bedroom and to be absolutely "hard-boiled" about kissing, fondling them or any close or intimate contact with them. Have the sputum examined once a month. See that the "handkerchief reflex" is second nature to him. See that every other member of the family is or has been examined. In many cases this has already been done. If not, see to it yourself. Do a skin test on each of the children and x-ray and examine the positive ones. If the x-ray does not mean much to you, take it and the child to the proper authority for advice. Examine and x-ray the adults as well as children. Do not let any fear of being accused of "drumming up practice" prevent your doing this. Particularly, look for any elderly person in the family who may or may not have a chronic bronchitis or a winter cough.

Now as to diet. Most patients of the class we are discussing—convalescents—are dis-

tinctly overweight Make up your own mind as to what the patient should weigh, his "optimum weight," as it were, and try and maintain a level slightly about it Do not make him carry around fifteen to twenty pounds of useless fat, however A glass of milk with each meal is usually advisable Eggnogs, egg and milk, are inventions of the devil and should be prohibited

Exercise Find out what the patient has been allowed to do at the sanatorium and continue from there If he has been given a twenty-minute walk twice a day, increase this very gradually I allow my patients to ride—not *drive*—in an automobile about twice the time that they are permitted to walk Let them understand that riding in an auto is a definite form of exercise See to it that they must quit whatever they are doing, not *when* they feel tired, but *before* they notice signs of fatigue This is not so easy Tell them to approach and leave each meal in a rested condition A good rule for these patients to follow for the rest of their lives is "Don't run when you can walk, don't walk when you can stand still, don't stand when you can sit down and don't sit down when you can lie down"

One very important point and a most neglected one is to see that there is mental as well as *physical* exercise A patient of mine was a cost accountant at a large firm His disease was apparently arrested and he could walk six or seven miles without symptoms of fatigue He only laughed when I told him that he must get his brain in training as well as his body So I gave him a demonstration and made him take temperature and pulse before and after two hours' intensive work on tables, etc., or whatever cost accounting consists of This he did for five days The results were instructive, and a little humiliating to him His pulse before this mental work was always in the low seventies but after it rose to 85 and 90 while his temperature, always normal or subnormal, after two hours' hard mental work ran 99 to 99.8 He learned his lesson So much for these convalescents Their progress must be slow and gradual, it cannot be hurried

Now we come to the third class, those who are ready to do some work, and the question of getting them back on the job Here we

have a subject on which volumes have been and still are being written It is really not so difficult, however, in most instances, simply requiring common sense and willingness to take a little trouble on the part of the physician and a degree of intelligence from the patient Certain points stand out at once

There is a large group of patients, mostly men, who are in such condition that they could perfectly well go back to work at regular hours were it not for the fact that their former job involved hard physical exertion or was in other ways a dangerous one This group offers difficult and often pathetic problems The man who has been stone-cutting for years, or who has worked in a foundry or at a pick and shovel job, and who has been able to support wife and family at it now finds himself entirely and forever cut off from that means of earning his living Here is a task that will test the ingenuity and indeed the humanity of every physician

In considering this question the following suggestions may help

1 When possible, try to get the ex-consumptive back to his old job unless, as shown above, it is a quite impossible one for him Remember that there are three kinds of work to which he simply cannot return, first, that in which he is exposed to a dangerous dust—silica, such as granite cutting or foundry work, or the asbestos industry, second, that which requires hard physical exertion, and third, that work in which the hours are excessively long or which has to be done under unhygienic conditions These are absolutely ruled out

2 Try to arrange with his employer or in some other way that he can start in gradually, working only two or three hours at first and taking perhaps a month or even more before he is back at full time

3 Do not look for a "light outdoor job" For all practical purposes, "there ain't no such thing" New England is crowded with the graves of those consumptives who have starved to death looking for these will-o'-the-wisps

4 Tell the patient to be "hard-boiled", that he must look after his own health first and the welfare of the concern for whom he is working second Advise him frankly to fol-

low the example of WPA workers and not do any more than is absolutely required Tell him to take his full hour off for lunch and to quit on the stroke of five Advise him to take advantage of the many opportunities that are bound to come up even if only for two or three minutes—to sit down and absolutely relax Above all, see that he takes the ordinary acute infections, grippe, coughs and colds, to which most of us pay little or no attention, seriously If he comes down with a cold he *must* quit work and go to bed until it is gone This is the only safe thing for him to do

5 Finally, look around and avail yourself of local agencies and resources designed to help out in just such problems

They may be grouped as follows

A Placement Bureaus or Committees

My own association and the leading ones elsewhere maintain such a placement bureau with a full time worker in charge Her job is to meet and talk with ex-consumptives referred to her by physicians or in some other way, to gain their confidence, and find out their capabilities and training and then through her connection with employers of all kinds to find or try to find suitable employment for them This is always a difficult and, too often nowadays, an impossible task It can be done, however

B Sheltered Workshops

The Altro Shop in New York where about 200 men and women, each an "ex-tb," are given employment, and my own Sheltered Workshop in Boston, are excellent examples of these The one in New York, with 200 workers, I believe, about breaks even financially, ours in Boston with only 40 to 50 patients is bound to be in the red as far as dollars and cents are concerned But there are many products of such a shop in the way of renewed faith, courage and happiness that make up for any monetary loss

At such a shop men and women are given work and are paid by the hour for skilled and unskilled labor The number of hours prescribed depends upon the patient's physical condition and is increased gradually as his general health and the state of the lungs permit Positive sputum cases are not re-

ceived Each worker is under detailed and close medical supervision in the home as well as at work and is examined regularly In our shop the men do high-grade cabinet work, furniture making and repairing of all kinds while the women make lingerie, ladies bags etc Our products are sold in the open market at current prices and our sales are not dependent, as is too often the case, upon sympathy and sentiment Each year our sales have gone up so that we ask for less and less support from the foundation that enables us to carry on The multiplication of such shops in the large centers of this country will go far toward solving the problem of employment for those handicapped by tuberculosis

C Farm and Industrial Colonies

I would urge that every doctor at all interested in this subject on his next trip to England to visit Cambridge University and there fill his mind with beauty and tradition Having done this, let him take a dilapidated taxi—there are no others—and drive the six or seven miles through delightful English countryside to the village of Papworth Papworth is the best example of an industrial colony for consumptives in existence It is a typical one-street English village with some 1500 inhabitants Families live in quaint little cottages with "hostels" for single men and women Tuberculous individuals in all stages are to be found there Printing, upholstery and cabinet-making, building of portable houses, are minor products but the chief industry is the manufacture of valises, suitcases, traveling bags, etc, of all kinds from the cheapest to those of the very highest quality The Papworth products are on sale and are known all over England and Scotland and have a well-deserved high reputation

Here is employment for the tuberculous at its best The setup in England has certain advantages that are lacking in this country In the first place, many of the patients are subsidized at the rate of a pound a week from the crown or some other source Next, the English climate is much more suited for such work than is ours Finally, the English man or woman of the class that would go to such a colony is a very different individual from his American cousin The "farm colony" idea has been tried over here with little or no success

The average American workman who has had tuberculosis is as anxious to earn his living as anyone else but, after a prolonged stay of one or two years in a sanatorium, he insists, and quite properly so, that his work be where he can go home to his family at night or at least where he can see them frequently. He is quite unwilling to be placed at a distance off in the country, no matter how beautiful the surroundings. He is not interested in growing apples or in raising chickens, at least in the vast majority of cases.

Our Massachusetts attempt in this direction established by the late Dr. Vincent Y. Bowditch after struggling for years will, I believe, soon give up the fight. As a factor in the care and rehabilitation of the ex-sanatorium patient in this country attempts in this direction I believe are bound to fail.

Looking on this problem from a broad and practical standpoint, on what are we to depend for the care of the tuberculous man and woman upon leaving the sanatorium?

Will it be by subsidies from municipal, state or federal sources? Will it be by the multiplication of "placement bureaus" or of "sheltered workshops"?

To me the answer is definitely in the negative. All this will help but it will not go far by itself in solving the problem. It is the general practitioner, the biggest and most vital force in medicine today, that must and will shoulder the burden.

Its solution depends upon certain essential points that I have already called attention to here and which may be summarized as follows:

1. Plans for the future care of the patient should be commenced while he is still in the sanatorium.

2. Details concerning his exact condition upon discharge with recommendations for the future should be transmitted to his family physician and the patient told to report to him at once.

3. The family doctor should take complete charge of the case and emphasize the importance of his reporting regularly for examination and periodical x-rays.

4. If it has not already been done, other members of the family should be examined, the children given skin tests and if it is positive, x-rayed and the adults x-rayed in every case.

5. When the question of going to work comes up

A. Get him back to his old job if it is a suitable one.

B. Try to have him start in gradually.

C. Do not let him do work which involves hard physical exertion, exposure to dust or bad working conditions.

D. Investigate such local resources as a "placement bureau" for the tuberculous, a "sheltered workshop," and take advantage of them. They may help you amazingly in solving this problem.

6. Finally, may I state that I consider this whole problem of after-care of such importance that I should like to see it on the program once a year of every medical society attended by general practitioners. A subject such as this would do infinitely more good than erudite and technical talks on how to take out ribs or how to crush the phrenic nerve or to do other intricate procedures.

Of the greatest importance of all, despite the openly expressed opinion on the part of many health officials of my own state and elsewhere that tuberculosis is "a public health problem, pure and simple," remember that it is a human problem as well. You and I are not interested in tuberculosis by itself. But we are deeply and vitally interested in human beings, men and women, who have tuberculosis, and in the problem as to how best and quickest they can be restored to health and happiness.

Reading time of papers published in
DISEASES OF THE CHEST
from five to fifteen minutes

What of the Family Physician?

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FOR a long, long time the writer has marveled at the manner doctors have of complimenting themselves on being members of this noble profession of medicine. How complacently they enjoy sitting at some public gathering and hearing it so described, or seeing it so referred to, in the lay press or on the radio. How eagerly they listen time and again at medical meetings to some one, most often of their own number, reel off platitudes and encomiums on the greatest of professions and on the sacrifices made by its members at the altar of poor suffering humanity.

During the past few years the endless controversy over socialized medicine has brought the medical profession more and more into the lime-light and with it, from among their own members, the plea for the proper maintenance of the old "patient-family doctor" relationship. The question arises, "Does this very large group of physicians, the family doctors, really merit the trust and esteem that is imposed in them by uninformed and unsuspecting patients who have no means of gauging the true medical ability of those in whom they would place their confidence and the safety of the lives of themselves and their loved ones?"

To the relatively small group of physicians who are particularly interested in tuberculosis, the question has presented itself many, many times. The observation of palpably inadequate knowledge and understanding of the subject on the part of so large a number of physicians when dealing with the disease, forces the sad commentary that they have been weighed and found wanting when handling this still outstanding cause of death among our civilized peoples.

A generation is a brief period in the progress of medicine, but in that time such marvelous advances have been made in the field of tuberculosis that the whole picture of etiology, diagnosis and treatment have markedly changed. The lowered death rate that has resulted from the advances needs no comment. The discoveries made and brought into practical use through research

workers and the well organized army of specialists who have availed themselves of these discoveries, have produced results beyond the fondest hopes of a Koch or a Trudeau.

Has the general practitioner the good old family doctor, been true to his trust however, in keeping abreast of these new means at his disposal so that he may at the earliest possible moment make them available to his patient? There has undoubtedly been a long step forward in general education and training on the subject of tuberculosis. This is to be taken advantage of during undergraduate days, as presented in the curricula of the medical schools of today. Later, there are greater opportunities than ever in postgraduate work for those who will avail themselves of it. However, it is to the discredit of a very large number of medical men that, while students in college and in the years after leaving it, they should seem so often to shun such ample facilities for education on the subject, showing no interest in, nor desire to master, tuberculosis.

The writer makes this observation after years of general and later special practice. Many have seemed to evade, actually fear, contact with the disease and if, in practice, they make a belated diagnosis of what has by this time already become an "advanced" type largely through their own indifference, they hasten to transfer it and literally, as well as figuratively, wash their hands of the case. There is a decided disinterest in their patient's welfare insofar as keeping themselves professionally fit to offer the best possible service in prevention, diagnosis, or treatment of tuberculosis.

Collateral reading on the subject becomes, in the mind of the average practitioner, a virtual waste of his time. This, it may be observed, holds true of his attitude toward a number of other outstanding present day causes of death about which patients daily consult their physician and from whom they have a just right to expect the latest and best approved methods of diagnosis and treat-

ment that the profession has to offer

The medical degree of our accepted schools as well as the license to practice, which doctors display, should be ample assurance to the person seeking advice or treatment that the holder thereof possesses everything there is, within reasonable limits, on these subjects, but are often really a snare and a delusion instead. Through timely education in, and adoption in his practice of, modern methods, it becomes a false pretense for the family physician thus to fail at early diagnosis of any of the more serious afflictions that are leaders in the causes of death.

If specialization is open to criticism in present day practice, it certainly can be said of it with relation to tuberculosis, that had the relatively small group which have taken up this disease as a specialty, not done so, much of the present progress in its control would still be a mere hope. Hopefully, nevertheless, the tuberculosis physicians have continued and optimistically they have strived to interest more and more the family doctor in early diagnosis.

As a result it has been noted that frequently friction and discord develop in localities when the home doctors have been oblivious and indifferent to the advances being made in fighting tuberculosis. They have persisted in *statu quo* until volunteer health groups of laymen organize a campaign against the "Great White Plague" and bring into their community modern methods and personnel to wage the battle.

Realizing then, that he has been allowed to "stand-by" through his own lack of interest, the local family physician at this stage presents a definite antagonism to any such progressive health program even to the belittling of specialist professional services that had been made available to his people.

In many instances, through the past three decades, the writer has remarked how the volunteer organizations are manned almost entirely by laymen and their officers as often unable to enlist an active interest on the part of even one local physician. These organizations must dominate the tuberculosis situation in many places and as a result of the aforementioned attitude of the medical profession locally, are forced to secure the services of outside professional men who are

expert in their particular line of work, much to the chagrin of the home man, our much-vaunted family doctor.

For such a condition the local physician has no one to blame but himself. He has been noted many, many times to be ignorant of the significance of relatively simple modern methods of diagnosis and treatment and inexperienced in their frequently very simple use. Means that have been written about, spoken about, demonstrated, and at his disposal all over the country for years.

It seems quite evident that every general practitioner should acquaint himself routinely with modern, up-to-the-minute procedures in the diagnosis and treatment of tuberculosis. For such an outstanding disease that is so frequently encountered by every one in practice, if he will but look for it, the doctor should be so equipped that his local nurses and lay workers and health officers would seek *him* first for information and advice.

Looking over the statistics, it is very noticeable that very few registration districts show the accepted relation between reported tuberculosis deaths and reported existing tuberculosis cases. *Why?* Absolute indifference on the part of the family doctor, to whose attention the case should first come, even if diagnosed late, to make such morbidty report to the proper health officer. It is the neglect engendered by that mental slant which, during the medical college course and hospital internships, leads the young medical man to "cut" tuberculosis ward classes and out-patient clinics as though they were poison and then in later years condemn the medical school and the hospital for failing to afford proper and sufficient facilities for studying this disease.

Solid and substantial advances are being made in all fields of medicine constantly although necessarily slowly, laboratory methods are devised just as slowly and meticulously, clinical practice presents the sternest tests and checks upon all that is new. All this makes for real progress. For the medical man, just as surely as in other lines, "input plus training equals output and quality." The noble profession must do more than hold its own, it must consistently advance and it can only advance by being

willing to continue to reinvest time and effort and funds for further education. He who keeps up with advances is he who outstrips his ordinary "run of mine" competitor. Post-graduate activities, collateral reading, participation in and attending medical group meetings, hospital ward and clinic services, preparation of scientific papers, attending graduate teaching seminars, all seem within reach of everyone and all are important. They will naturally require an expense of

time and energy mostly, but is it not all too apparent that the successful man professionally (this is not necessarily synonymous with financially) is the one who is willing and happy to make this reinvestment in his life's chosen field?

The much-vaunted family doctor must prove himself worthy of the trust imposed in him with particular emphasis on tuberculosis,—its diagnosis, care, and treatment

Hodgkin's Disease and Tuberculosis

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HODGKIN'S Disease is one of several disorders that is accompanied by progressive enlargement of the lymph glands. Opinions differ as to whether it should be classified with the neoplasms as lympho-sarcoma, with the blood dyscrasias such as the leukemias, or with the infectious granulomata as tuberculosis and syphilis.

Clinically, it closely resembles glandular tuberculosis with which it is often confused. Nearly every case of Hodgkin's Disease that has come under the observation of the writer in the past few years has been referred because of a previous diagnosis of tuberculosis or as a tuberculosis suspect. Next to tuberculosis, Hodgkin's Disease is the most common cause of progressive glandular enlargement. To make the picture more confusing, it is quite possible for tuberculosis and Hodgkin's Disease to co-exist in the same patient. In fact a considerable number of patients with Hodgkin's Disease develop frank pulmonary tuberculosis with positive sputum as a terminal stage of their disease.

Hodgkin's Disease usually occurs in the same age group as tuberculosis, i.e., in early adult life. There is a similar insidious onset, with loss of weight, increasing fatigue and weakness, a low grade fever and secondary anemia. However the glandular enlargement of Hodgkin's Disease is usually somewhat different from that of tuberculosis. The swelling is painless, and progresses from one group of glands to another. The glands remain firm,

discreet and freely movable and do not tend to fuse together and break down and suppurate as tuberculous glands so frequently do.

Occasionally groups of internal lymph nodes, such as the tracheo-bronchial or retroperitoneal glands, are involved before any external enlargements are noted, and in such cases the diagnosis is difficult. When the thoracic group is primarily affected the resemblance to tuberculosis is often striking. Along with the debility there is an irritating cough and frequently dyspnoea from pressure on the trachea or bronchi. There may be hoarseness or complete loss of voice from pressure on the recurrent laryngeal nerve. Dyspnoea from pleural effusion is often the first symptom that brings the patient to the physician. Difficulty in swallowing from pressure on the esophagus is not uncommon. Examination of the chest does not reveal much abnormality unless there is pleural effusion or massive enlargement of the mediastinal glands. There may be noticeable dyspnoea or displacement of the heart from pressure. The spinal and para-sternal areas of dullness may be widened and there may be some rales due to the associated bronchitis. The x-ray will show an irregular mass in the mediastinum, which may be concealed by the heart shadow unless viewed obliquely. There are often patches of infiltration throughout the lung areas when scattered bronchial nodes are involved.

When Hodgkin's Disease involves the retro-

peritoneal glands it may closely simulate tuberculous peritonitis. There is abdominal pain and tenderness with various digestive disturbances, such as anorexia, flatulence, nausea or diarrhea, and frequently there is jaundice or ascites. A definite diagnosis is almost impossible without an exploratory laparotomy until the superficial glands begin to enlarge.

Like tuberculosis the blood picture of Hodgkin's Disease varies with the severity and stage of the disease. Essentially it is a progressive secondary anemia which in the later stages may become extreme. The number of white cells may be within normal limits in the early stage, but later there may be marked leucocytosis. The differential count is variable, but an increase in the number of eosinophiles is significant.

The final diagnosis of Hodgkin's Disease

depends on microscopical examination of an affected gland. Preferably, an isolated gland should be excised for this purpose. The histological changes need not be described here, but they are quite characteristic, and in the hands of an experienced pathologist a positive diagnosis can usually be made.

For prognostic reasons it is extremely important to differentiate Hodgkin's Disease from glandular tuberculosis as early as possible. While glandular tuberculosis is comparatively mild and usually curable, Hodgkin's Disease invariably has a fatal termination. Surgical removal of isolated groups of enlarged glands or deep x-ray therapy may stay the progress of Hodgkin's Disease for a time, but death ordinarily occurs in from two to five years in spite of any form of treatment yet discovered.

Artificial Pneumothorax in Clinic Cases

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THE treatment of pulmonary tuberculosis without transplantation of the patient has always been a much more difficult task than treatment with institutional care. In fact, removal of the patient from his normal environment has proved so beneficial that until recent years physicians thought that the change of climate was responsible. It is now felt by most workers that climate plays a less important role, but, as pointed out by many writers the patient is unable to relax at home. The unvarying routine, better nourishment, and the force of precept and example are very important factors and not to be overlooked. These factors can be supervised a little more carefully in clinic work with good results.

Until recent years care of the tuberculous patient in the home and clinic has been a rather desultory procedure with a hopeless attitude on the part of the physician and all attendants. This was disastrous to the morale of the patient and endangered his recovery. The use of artificial pneumothorax has changed this attitude somewhat and is prov-

ing very beneficial to the patient mentally and physically as well as eliminating some of the danger to contacts. Pneumothorax has already been discussed at great length, its advantages and disadvantages, its dangers and contraindications have been reviewed thoroughly by those conversant with the subject and most of them agree, I believe, that the induction of pneumothorax in a new patient in the clinic is an undertaking fraught with many hazards.

It is better for the patient to have a few weeks of strict bed rest in an institution with careful supervision to determine whether the disease is progressing or regressing before pneumothorax is attempted. However, tuberculosis is notoriously progressive and though small cavities may sometimes heal without collapse therapy this is the exception rather than the rule and some eighty-five per cent of all patients with open tuberculosis die within a period of five years under conservative treatment alone. In communities where there are no beds for those suffering with tuberculosis nearer than the State Sana-

torium, and a long list of patients waiting for those beds, it becomes a necessity to make some effort to stem the ravages of the disease both in the patient and in those whom he may infect. When we consider that there are about eight hundred thousand active cases of tuberculosis in this country and only about ninety thousand beds we can understand what an enormous number of people are in danger of infection. These facts emphasize the necessity, we are neatly trapped between Scylla and Charybdis. Most southern communities have few beds for the tuberculous and a large negro population which makes the problem more acute.

During the last months of 1933 stirred by the ringing dictum of Cleve Reviere we began to induce pneumothorax on a few selected cases waiting for admission to the State Sanatorium and to continue refills on patients discharged from the Sanatorium. Since that time we have given about four thousand injections of air to one hundred and thirty-five patients, sixty white and seventy-five negroes. A statistical report of the results obtained would be most difficult because of the transient character of some of the patients and their failure to co-operate, because of the varying stages of the disease and the types of pneumothorax used, expansile, static, and compression, because some of the patients have been to the State Sanatorium and others have not.

Our results correspond rather closely in most details to those reported by other clinics. We feel that the negroes with similar types of lesions did not respond quite so well as the white patients, probably because of economic reasons and lack of co-operation. There were only four untoward reactions, two in white and two in negro patients, none of them fatal. Ninety per cent of patients taking air for three months or longer have shown improvement in reduction of fever, cough and sputum, or gain in appetite and weight and most of them in all these respects. Satisfactory collapse has been obtained in

most cases taking air for as long as twelve months and in many cases, of course much earlier. Three cases not suitable for pneumolysis obtained satisfactory collapse after almost two years. They, of course had shown improvement, both clinical and x-ray, during the twenty-four months. Also, as pointed out by many observers, marked clinical improvement occurred in many cases where the collapse was not satisfactory from the x-ray point of view, i.e., the cavities were not completely closed. There have been relatively few effusions and only one tuberculosis empyema which occurred in a far advanced case with bilateral involvement who had suffered spontaneous pneumothorax. The cases with the least involvement responded a great deal more readily and collapse was more often satisfactory. Also the younger patients responded more readily than the middle-aged and older.

Seven cases have been expanded and several others are being expanded at present. All patients are kept under very strict supervision while the lung is being expanded and for at least twelve months thereafter. Everything possible is done to keep the patient physically and mentally fit to gradually assume his accustomed place in society. The problem of rehabilitation is an essential part of the program and should receive careful consideration and meticulous attention to detail.

Granting that bed rest and institutional care is ideal before collapse is begun, since we cannot attain the ideal at present, our experience would seem to indicate

- 1 That effective collapse should be applied as early as possible before excavation and bronchiogenic spread.
- 2 That x-ray should be used more extensively to diagnose early lesions.
- 3 That artificial pneumothorax in the home and clinic is a practical procedure.
- 4 That rehabilitation is an essential part of the program.

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Sedimentation Rate in Pulmonary Tuberculosis*

NAGLA M LAF LOOFY, MD
Brooklyn New York

AS early as 200 A.D., Galen noted that if blood is allowed to stand in a tube, a white line is formed but he did not correlate this with pathological changes. In 1791, John Hunter noted that the red blood cells settled more rapidly in acute inflammation. Further observations were made by Nasse in 1836, Davey in 1839, Muller in 1844, and Biernacki in 1894. It was then forgotten until 1918, when Fahraeus observed that the red blood cells settled more rapidly in the blood of pregnant women. This, at first, was heralded as an early diagnostic sign of pregnancy, but discarded when found to be unreliable before the third month. Its value in the presence of inflammatory or debilitating conditions, however, was recognized. Its value in gynecology was pointed out by Linzenmeier in 1920, Friedlander in 1924, and Polack in 1926, its value in tuberculosis by Cutler in 1926, and in urology by Weirbein in 1928.

Several theories have been advanced as to the mechanism of this phenomenon. Fahraeus believes that there is an alteration of the electrical charge of the red blood cells causing a loss of their repelling force and thereby bringing about their agglutination and more rapid sedimentation. Reyner contends that differences in surface tension of the blood plasma develop, causing a more rapid precipitation of the red blood cells. Hirsh feels that the sedimentation rate is influenced by a foreign protein in the circulation, in pregnancy, proteins of fetal catabolism, in infection, proteins of bacteria, in malignancy and coronary occlusion, proteins of necrotic tissue. The consensus, however, seems to favor the theory of an alteration in the serum fibrinogenglobulin ratio. Greisheimer has shown that there is a definite correlation between the serum fibrinogen and the sedimentation rate, and that the ratio is directly proportional to the concentration of the fibrinogen in the serum.

In normal metabolism there is a certain amount of tissue destruction. This is indicated by the so-called normal sedimentation rate variation. Certain physiologic conditions affect metabolism. These are reflected in the sedimentation rate. The rate is slightly higher in infants, children, senile individuals and during the menses. Greisheimer in a study of 174 sedimentation rates in 31 healthy individuals found that the sedimentation rate will vary from week to week in the same individual, but that the variations will be within normal limits. According to Haverson and Petersen, meteorological conditions affect the sedimentation rate, the daily variations being as great as 100 per cent. In Patterson's determinations, taken at an altitude of 6231 feet, the sedimentation rate is lower for the higher altitude. The sedimentation rate also varies with the physical characteristics of the blood. Walton demonstrated that anemia has a distinct bearing on the sedimentation rate, the cells settling more rapidly the greater the anemia. For accurate determinations, correction of the sedimentation rate for anemia should be done and hematocrit readings taken on the same sample of blood. However, for practical purposes, since the majority of individuals have a red blood cell count of over 3,500,000, the readings would fall within normal limits. In pathological conditions the variations would be so slight as to have no practical significance. It is now generally conceded that in the presence of marked tissue destruction, the erythrocytes settle more rapidly. The toxin produced by the disease breaks down tissue protein, thereby stimulating fibrinogen formation. Hence the sedimentation rate is directly proportional to the amount of tissue destruction or the severity of the disease.

Several methods have been employed to measure this phenomenon. Originally Fahraeus measured the distance that the red cells settled in one hour. Linzenmeier measured the time it took a column of blood to settle a certain distance, arbitrarily set at

* Read before the Brooklyn Thoracic Society February 19, 1937. From the Tuberculosis Service of the Kingston Avenue Hospital.

18 mm Cutler has combined the two methods in graph form and his technic has become fairly universal. The original Cutler tube is a 65 cc tube, graduated in tenths of a cc. Readings begin at zero at the 5 cc mark at the top and go down to 50 mm. One-half cc of sodium citrate solution and four and one-half cc of venous blood are gently mixed in a syringe and placed in the tube. Readings are taken every five minutes for one hour and the observations are plotted on a graph, the horizontal lines of which represent divisions on the tube and the vertical lines intervals of time. He has modified the above technic using a 1 cc tube with 0.1 cc of sodium citrate solution and up to 1 cc of blood. Comparative studies show that the two methods are identical. The advantage of the latter modification is apparent.

Pulmonary cases group themselves in four characteristic graph lines on Cutler's chart—the horizontal line, the diagonal line, the diagonal curve and the vertical curve. The horizontal line indicates the absence of any active destructive process and is similar to that found in clinically healthy individuals. It does not, however, exclude the possibility of disease which may be present in an inactive form as in the case of a well-healed tuberculosis. It may indicate the absence of any disease or the presence of disease not sufficiently active to disturb the normal stability of the blood. The diagonal line and the diagonal and vertical curves are abnormal findings and are directly proportional to the amount of tissue destruction. Therefore, we may say that in tuberculosis the diagonal line is an index of minimal activity without constitutional symptoms, and the diagonal and vertical curves, respectively, are indices of moderate and marked activity. By this method the normal rate for men is found to be between 2 and 8 mm with an average of 3 and 4 mm, and for women between 2 and 10 mm with an average of 5 and 6 mm.

In our series 100 consecutive discharges from the tuberculosis service at the Kingston Avenue Hospital, Brooklyn, were studied to determine the value of the sedimentation rate. The sedimentation readings were divided into four groups to correspond with Cutler's four graphs, Group I, or normal

group, with a sedimentation rate to 8 mm, Group II, or quiescent group, with a sedimentation rate between 9 and 15 mm, Group III, or moderately active group, with a sedimentation rate between 16 and 20 mm and Group IV, or very active group, with a sedimentation rate over 20 mm. The patients were all males. Hematocrit and red cell determinations were not done. There were 12 colored and 88 white men. Their ages ranged from 16 to 66 with 4 in the second, 43 in the third, 21 in the fourth, 21 in the fifth and 11 in the sixth decade.

All were considered active cases. Eight were minimal, thirty were moderately advanced, and sixty-two were far advanced. Of the minimal cases, 50 per cent had sedimentation rates below 15 mm and 50 per cent rates over 15 mm. Of the moderately advanced cases, 50 per cent had rates under 15 mm and 50 per cent had rates over 15 mm. Of the far advanced cases, 25 per cent had rates under 15 mm and 75 per cent had rates over 15 mm.

ADMISSION CLASSIFICATION COMPARED WITH SEDIMENTATION RATE

Stage TBC	— GROUP —				Under 15 mm	Over 15 mm
	I	II	III	IV		
Stage I	2	2	1	3	8	50%
Stage II	7	8	6	9	30	50%
Stage III	6	9	7	40	62	25%

Though the sedimentation rate does not absolutely follow the actual extent of lesion, there is a marked tendency of a more elevated rate in the more advanced case provided it be an active case.

In correlating the sputum on admission with the sedimentation rate, the following was obtained. On admission, there were 68 cases with positive sputum and 32 with negative sputum. Of the six cases with negative sputum in Group IV, four later developed a positive sputum and one had a tuberculous empyema. With correction for these cases we find that 22 per cent of the positive sputum cases had a sedimentation rate under 15 mm and 78 per cent had a rate over 15 mm. Of the cases presenting a negative sputum on admission, 70 per cent had a rate under 15 mm and 30 per cent had a rate over 15 mm. The degree of activity, therefore, varies in direct ratio to the condition of the sputum.

ADMISSION SPUTUM COMPARED WITH SEDIMENTATION RATE

Sputum	— GROUP —				Under	Over	
	I	II	III	IV	Total	15 mm	15 mm
Positive	8	8	6	46	68	23%	77%
Negative	7	12	7	6	32	60%	40%

Corrected for the cases that later became positive

Positive	8	8	6	51	73	22%	78%
Negative	7	12	7	1	27	70%	30%

The constitutional activity of these patients was classified according to the National Tuberculosis Association classification a, minimal constitutional activity, b, moderate constitutional activity, and c, marked constitutional activity. In our series 66 were classified as a, 13 as b, and 21 as c. Of the 66 cases with minimal constitutional activity, 34 per cent had a sedimentation rate below 15 mm and 66 per cent had a rate over 15 mm. Of the 13 showing moderate constitutional activity, 39 per cent had rates under 15 mm and 61 per cent had rates over 15 mm. Of the 21 showing marked constitutional activity, 95 per cent had rates under 15 mm and 90.5 per cent rates over 15 mm. Constitutional symptoms, such as fever, elevated pulse, cough and expectoration, are not delicate indices of disease activity, as evidenced by patients whose symptoms will subside as soon as they are put to bed, long before there is any evidence of x-ray clearance or sputum conversion.

CONSTITUTIONAL ACTIVITY COMPARED WITH SEDIMENTATION RATE

Activity	— GROUP —				Under	Over	
	I	II	III	IV	Total	15 mm	15 mm
a	12	17	12	25	66	34 %	66 %
b	3	0	2	8	13	39 %	61 %
c	0	2	0	19	21	95 %	90.5 %

On discharge the cases were divided into those that showed complete x-ray resolution, those that showed incomplete x-ray resolution and those that showed x-ray progression. Of those showing complete resolution, 80 per cent had a sedimentation rate under 15 mm and 20 per cent had a rate over 15 mm. Of those showing incomplete resolution, 30 per cent had a rate under 15 mm and 70 per cent had a rate over 15 mm. Of those showing progressive lesions, 21 per cent had a rate under 15 mm and 79 per cent had a rate

over 15 mm. We see, therefore, that there is a definite decline in the sedimentation rate with x-ray resolution, and that the rate tends to remain elevated in those cases showing little resolution or progressive lesions.

DISCHARGE X-RAY COMPARED WITH SEDIMENTATION RATE

X-Ray	— GROUP —				Under	Over	
	I	II	III	IV	Total	15 mm	15 mm
Complete Resolution	30	17	5	7	59	80%	20%
Incomplete Resolution	2	5	3	7	17	30%	70%
Progression	3	2	2	17	24	21%	79%

The sedimentation rate was also checked against the sputum on discharge. Sputa were negative anywhere from one to seventeen months before discharge, the average being seven months. Negative sputa were all checked by concentrated examinations, and gastric lavage and guinea pig inoculations in some instances. On discharge 29 cases had positive sputum and 71 had negative sputum. Of the positive sputum cases, 38 per cent had sedimentation rates under 15 mm and 62 per cent had rates over 15 mm. Of the negative sputum cases, 71.8 per cent had rates under 15 mm and 28.2 per cent had rates over 15 mm. There is, therefore, a definite correlation between the condition of the sputum and the sedimentation rate, the negative sputum cases showing a lower rate than the positive sputum cases.

DISCHARGE SPUTUM COMPARED WITH THE SEDIMENTATION RATE

Discharge Sputum	— GROUP —				Under	Over	
	I	II	III	IV	Total	15 mm	15 mm
Positive	4	4	1	20	29	38 %	62 %
Negative	31	40	9	11	71	71.8 %	28.2 %

The average length of stay in the hospital for this group of patients was seven months. The majority of our patients are transferred to the Municipal Sanatorium at Otisville for further observation after the disease becomes quiescent.

It seems, then, that the sedimentation rate does not indicate the extent of pathology, but is an index of pathological activity. We have seen cases of far advanced tuberculosis with positive sputum and open cavity with a normal sedimentation rate. This can occur in an old fibroid tuberculosis with no active tissue destruction. The above analysis has

shown, however, that the sedimentation rate can be a very important supplement to x-ray and sputum examinations in foretelling the trend of the disease. An acute episode can sometimes be predicted by a sudden unexplained drop in the sedimentation rate.

I think these points can best be demonstrated by selecting a few cases from our group.

J A, an Italian, aged 23, was admitted July 10, 1936, with a far advanced lesion involving both lungs. His classification on admission was III a, weight 139, sputum G ii, and sedimentation rate 24 mm. He was put on absolute bed rest and transferred to the Municipal Sanatorium at Otisville at the end of four months, an apparently arrested case, with a gain of 24 pounds, negative sputum and sedimentation rate of 8 mm.

V B, aged 23, of Armenian parentage, was admitted December 6, 1935, with an hemoptysis of two weeks duration. His classification on admission was III c, weight 121, sputum G v, and sedimentation rate 23 mm. X-ray showed a dense exudative lesion of the entire left lung. Left artificial pneumothorax was instituted and a satisfactory collapse obtained. His temperature became normal January 3, 1936, and his sputum negative January 15, 1936. He was transferred to the Municipal Sanatorium at Otisville on May 5, 1936, six months after admission with a gain of 19 pounds, a negative sputum for four months, and a sedimentation rate of 6 mm. Incidentally, at Otisville he developed a massive pleural effusion with no effect on the sedimentation rate. The effusion was a simple serous one.

H S, an American, aged 29, was admitted February 7, 1936 with a moderately advanced lesion of the left lung with a cavity in the first anterior interspace. His classification on admission was II a, weight 131, sputum G x, and sedimentation rate 23 mm. A left phrenic exeresis and scalenotomy was performed on March 13, 1936. He was discharged July 20, 1936, as a quiescent case with a gain of six pounds in weight, sputum negative for four months, and sedimentation rate of 6 mm.

B P, Polish, aged 45, was admitted November 1, 1934, with a far advanced lesion involving the entire left lung and a cavity 8x7 cm in the extreme apex. Classification on ad-

mission was III c weight 139, sputum G x, and a sedimentation rate of 28 mm. Artificial pneumothorax was instituted on the left but had to be abandoned because of lack of closure of the cavity. A left phrenic exeresis and scalenotomy was then performed and the patient kept on absolute bed rest. In October, 1935, the sputum had dropped to G ii, and the sedimentation rate was 16 mm. The cavity diminished in size to 3x4 cm. Thoracoplasty was advised and performed in December, 1935. The patient was discharged in March, 1936, an apparently arrested case, with a gain of 24 pounds, negative sputum for six months, and a sedimentation rate of 7 mm.

J McC, an Irishman, aged 34, was admitted December 26, 1936, with a bilateral lesion and a cavity in the left first anterior interspace. Classification on admission was III a, weight 145, sputum G ii, and sedimentation rate 16 mm. Artificial pneumothorax was instituted successfully on the left and the sedimentation rate rose to 5 mm on April 5, 1935. Two weeks later he developed a spontaneous pneumothorax and empyema and ran a stormy course for six weeks. The sedimentation rate dropped to 27 mm. The pleural cavity was irrigated with saline and as soon as stability was reached, oleothorax was instituted. As the empyema was brought under control, the sedimentation rate rose to 15 mm in July, and to 10 mm in October, when the oleothorax was completed. He was discharged, an arrested case, April 29, 1936, with a gain of 29 pounds, a negative sputum for eight months, and a sedimentation rate of 7 mm.

J McB, an Irishman, aged 20, was admitted January 30, 1934, with a far advanced lesion involving both lungs. Classification on admission was III b, weight 110, sputum G iii, and sedimentation rate 22 mm. He was placed on absolute bed rest and in ten months transferred to the Municipal Sanatorium at Otisville, an apparently arrested case, with a gain of 25 pounds, negative sputum for five months, and a sedimentation rate of 15 mm. At Otisville, his sputum became positive and he was readmitted April 19, 1935, with a sedimentation rate of 16 mm. He was put back to bed and, though his sputum became negative, an annular shadow persisted in the right lung, and the sedimentation rate was 12 mm. A right phrenic exeresis and scalenotomy

was performed on October 25, 1935. He was discharged six months later with a negative sputum, and a sedimentation rate of 4 mm. Here is a case that was at first discharged before he was completely inactive.

W. H., an American, aged 40, was admitted September 26, 1935, with a moderately advanced lesion involving the upper two-thirds of the right lung. Classification on admission was II a, weight 130, sputum G II, and sedimentation rate 27 mm. A right phrenic crush and scalenotomy were performed and after a period of bed rest, the patient was allowed exercise preliminary to discharge. His sedimentation rate had risen to 6 mm on February 4, 1936, and x-ray showed considerable resolution of the exudative element. On April 22, 1936, the sedimentation report came back 18 mm. There had been no other evidence of trouble. On May 5th, he had a hemoptysis. In this case there was a drop of the sedimentation rate foretelling the pulmonary hemorrhage.

Conclusions

The sedimentation rate has been a useful adjunct in prognosis in pulmonary tuberculosis. It is an added index in foretelling the trend of the disease and is sometimes more sensitive than constitutional symptoms or x-ray in predicting the onset of acute exacerbations. It is a measure of active tissue destruction and therefore has no direct bearing on the extent of lung involvement or the presence or absence of tubercle bacilli except in

so far as these are indices of active tissue destruction. Consequently, it is quite possible to find a normal sedimentation rate in the presence of a far advanced fibroid tuberculosis with an open cavity and positive sputum. But, in the final analysis, each case of tuberculosis is an individual problem and must be evaluated as such. It must be remembered, however, that the sedimentation test is not specific, is not infallible, and that a normal rate is not conclusive evidence of the absence of disease.

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President's Address

(Continued from page 8)

of the National Tuberculosis Association committee. So far, this year, the National committee has not taken any definite action. It is true that this is a subject that will require a lot of study and a lot of work. It is our hope, however, that before the end of another year, there will be definite action on the part of the committees from both these organizations and that definite steps will be underway to put into effect in all our medical schools undergraduate teaching in tuberculosis such as is now in effect in a few of our

schools.

In conclusion, this organization, as it exists today, composed entirely of physicians whose work is devoted to some phase of tuberculosis, has come into existence because of the feeling that there are certain factors, vital to the solution of our tuberculosis problems, which, as yet, remain to be worked out. Today, I have attempted to outline at least some of these factors and to call attention to the rational course by which they can be worked out.

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NOTICE



The Second Annual Tuberculosis Seminar, at Asheville, will be held July 11-16. The number of physicians to take the course will be limited to twenty and the fee will be \$10.00. Special attention will be given to early diagnosis and to both surgical and medical treatment. Outstanding laboratory and clinical facilities are available. Applications will be acted upon in the order in which they are received and prompt action is necessary for those who wish to avail themselves of this opportunity.



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Chairman, Tuberculosis Seminar

Asheville, North Carolina

Organization News

San Francisco Meeting

The American College of Chest Physicians held its Fourth Annual Meeting at the St Francis Hotel, San Francisco, California, on June 12th. More than 100 physicians registered from 16 states, Hawaii, and British Columbia.

The morning Session was devoted to administrative and committee reports. A revised Constitution and By-Laws was adopted and it will be printed in the 1938 Pneumothorax Directory of the American College of Chest Physicians. Copies of the directory will be mailed to each of the members. A resolution was adopted opposing legislation designed to hamper the use of living animals for scientific studies in experimental medicine. The resolution was presented by the California Society for the Promotion of Medical Research. Dr Frank Walton Burge, Philadelphia, Pennsylvania, reported for the Board of Regents of the American College of Chest Physicians, and Dr E W Hayes, Monrovia, California, reported on the committee for Medical School Education. Dr Chas M Hendricks, El Paso, Texas, reported for the secretary-treasurer of the American College of Chest Physicians. In the absence of Dr Louis Mark, Columbus, Ohio, chairman of the Sanatorium Committee, the report of the Sanatorium Committee was read by Dr Frederick A Slyfield, Seattle, Washington, a member of the Sanatorium Committee. The report of the Nominating Committee was presented by Dr John H Peck, Oakdale, Iowa. Dr E W Hayes, President of the American College of Chest Physicians was introduced by Dr Wm C Voorsanger of San Francisco, Chairman of the Committee on General Arrangements for the meeting and President of the San Francisco County Medical Society. Dr Hayes presided at the meeting and delivered the "Presidential Address" which is published elsewhere in this issue of the journal. Dr Champ H Holmes, Atlanta, Georgia, the incoming president, closed the morning Session with an inspiring address which will be published in a subsequent issue of this journal.

Round Table Discussion

Dr George Becker, Epidemiologist and Assistant Director of the San Francisco City and County Health Department delivered an interesting talk on "Tuberculosis from a Public Health Standpoint." The speaker was introduced by Dr Ralph C Matson, Portland, Oregon, President-Elect of the American College of Chest Physicians.

Scientific Session

The Fourth Annual Scientific Session of the American College of Chest Physicians was held in the Borgia Room of the St Francis Hotel, San

Francisco, on the afternoon of June 12th. Dr Harold G Trimble, Oakland, California, Chairman of the Scientific Program Committee, presided.

Dr Sumner Everingham, Oakland, California, presented a paper on "Extra-pleural Pneumothorax." The paper was discussed by Drs Frank S Dolley, Los Angeles, California, Emil Bogen, Olive View, California, and Frederick A Slyfield, Seattle, Washington.

Dr Chevalier L Jackson and Dr Frank W Konzelmann, Philadelphia, Pennsylvania presented a paper with lantern slides on "Bronchial Adenoma." Dr Alfred Goldman, San Francisco, California, discussed the paper.

Dr John H Peck, Oakdale, Iowa, gave a paper on "Tuberculosis in General Practice." The paper was discussed by Drs James M Odell, The Dalles, Oregon, Ralph C Matson, Portland, Oregon, and Chesley Bush, Livermore, California.

The papers will be published in the future issues of *Diseases of the Chest*.

Banquet Speaker

The Fellows of the American College of Chest Physicians were addressed at their annual banquet by Dr Karl Meyer, Director of the Hooper Research Laboratories, San Francisco, California. Dr Meyer spoke on "Host, Parasite Relationship." He was introduced by Dr Wm C Voorsanger, Toastmaster for the evening. Guests of Honor who were introduced were Dr and Mrs Loren R Chandler, Dean of the Stanford Medical School, Dr and Mrs Philip Pearson, President, California Tuberculosis Association, and Dr and Mrs George Becker, Assistant Director of the San Francisco City and County Health Department.

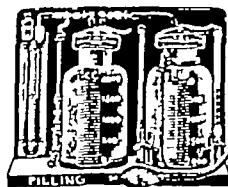
The Fellows of the American College of Chest Physicians, their wives and friends, were guests to a cocktail party given by Dr and Mrs Harry C Warren preceding the annual banquet. Entertainment was furnished by the Neapolitan trio.

Women's Committee Entertains

The wives of the visiting physicians were entertained for breakfast at the Cliff House, San Francisco, overlooking seal rock. A motor tour of the city was arranged by the committee. Members of the Women's Entertainment Committee were Mrs Harry C Warren, Chairman, Mrs Ralph B Scheier, and Mrs Buford H Wardrip.

Scientific Exhibit

Dr Clifford D Mason, Livermore, California, prepared an interesting exhibit for the American College of Chest Physicians in the Section on Scientific Exhibits at the Municipal Auditorium, San Francisco. The exhibit consisted of



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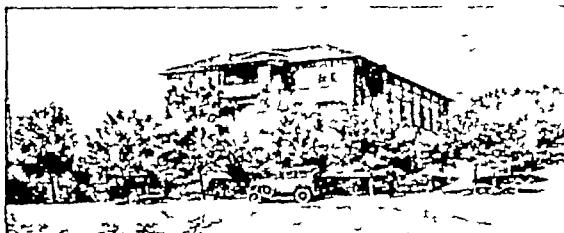
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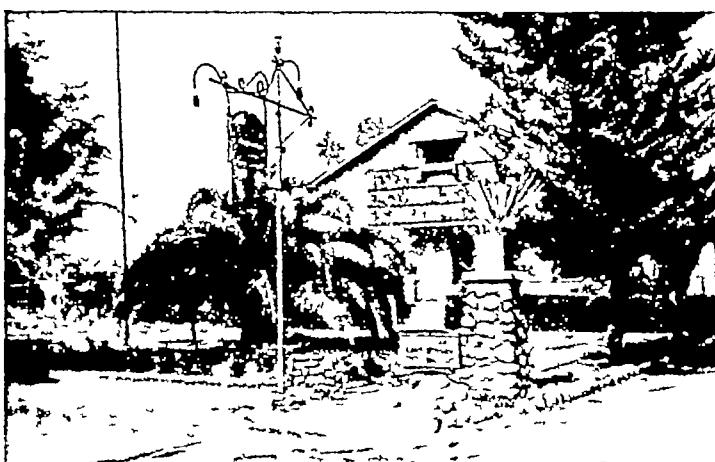


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three sections of slides shown in lighted view boxes. More than 100 of these slides were used to explain a series of interesting cases of childhood tuberculosis, preventoria care, collapse therapy, etc. Several hundred physicians registered at the booth for literature on tuberculosis. They will be mailed sample copies of "Diseases of the Chest."

Convention Cities Chosen for Three Years

The American College of Chest Physicians will meet in annual session at St. Louis, Missouri, 1939, at New York, 1940, and at Cleveland, 1941. These cities were chosen by the American Medical Association for their annual meetings and the American College of Chest Physicians will meet at the above cities in connection with the American Medical Association.

Report of Board of Regents

Frank Walton Burge, M.D., Chairman

The members of the Board of Regents have endeavored to grant Fellowship in the American College of Chest Physicians only to those physicians applying, who qualify as gentlemen and chest specialists of good training and at least five years' experience in the specialty.

As of May 6, 1938, 39 new members were admitted during 1938. It was necessary to reject 67 applicants, who applied for Fellowship from all over the United States, due to insufficient time in the specialty, insufficient training, practice not limited to chest diseases in communities that could support a chest specialist, etc. Four members resigned. The resignations came from New York State. Three members died. As of May 6, 1938, total membership was 483, but has since

increased as since that date, a number of applicants have been accepted for Fellowship in the College. Four applications are still being considered by the Board of Regents.

A Certificate of Fellowship was designed and offered to the membership of the American College of Chest Physicians. As of June 10th, 1938, 221 Fellows have ordered certificates. Two hundred seventeen orders have been accepted and are now in process of mailing. Four orders are being held up, awaiting notification from our Treasurer that those physicians have paid their 1938 dues.

Dr. Burge Elected Director

Dr. Frank Walton Burge, Philadelphia, Pennsylvania, Chairman of the Board of Regents of the American College of Chest Physicians and Editor of Diseases of the Chest was elected a member of the Board of Directors of the Philadelphia County Medical Society for three years.

SOCIETY NEWS

Dr. William W. Buckingham, Kansas City, Missouri, a Fellow of the American College of Chest Physicians, delivered a paper on "Indications for Collapse Measures in Pulmonary Tuberculosis" before the Jackson County Medical Society, Kansas City, Missouri on May 24th.

Dr. Irving L. Applebaum, Newark, New Jersey, a Fellow of the American College of Chest Physicians, discussed a paper on "Childhood Tuberculosis" before the Second Annual Meeting of the New Jersey Association of School Physicians held at Atlantic City, New Jersey, May 20th.

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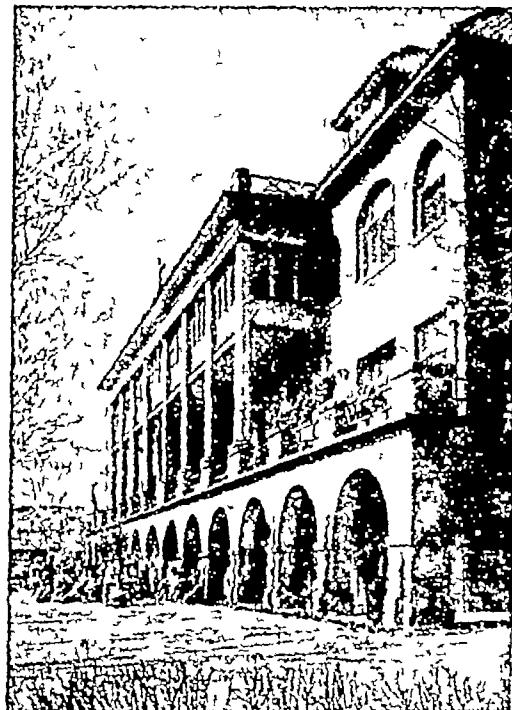
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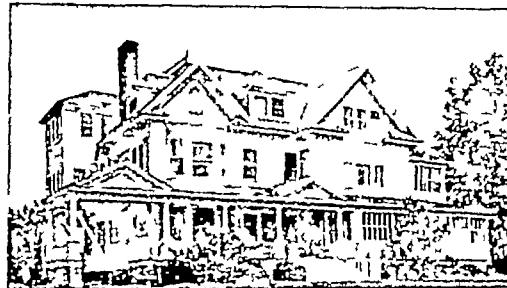
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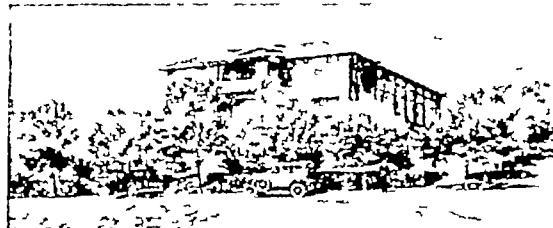
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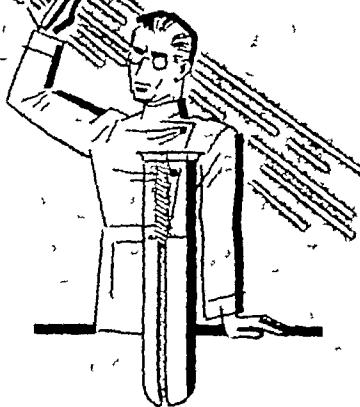
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Entered as second-class matter
August 18 1936 at the post office
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Editorial Comment

PACIFIC COAST STATES ISSUE IN conformity with a policy which was started at the inception of this journal, one issue of *Diseases of the Chest*, is devoted each year, to the presentation of a picture of sanatorium facilities, of the advances made in tuberculosis control in one state or in a group of states in this country

In 1935, the August issue of *Diseases of the Chest*, was dedicated to the State of New Mexico In 1936, the May issue of *Diseases of the Chest*, was dedicated to the State of Missouri In 1937, the June issue of *Diseases of the Chest*, was dedicated to the States of North Carolina, South Carolina, Virginia, Georgia, and Florida, and it was known as the *South Atlantic States Issue*

This year, it is our privilege and pleasure to dedicate this issue of *Diseases of the Chest*, to the States of California, Oregon, and Washington, and the issue is to be known as the *Pacific Coast States Issue*

Each of the states represented in this issue of the journal has contributed two or more scientific papers, dealing with subjects related to chest diseases, and written by physicians who are closely identified with the treatment of chest diseases in those states

Each of these states has presented a picture through the printed word and by illustration, showing the present facilities for the

treatment of the tuberculous within those states

This issue of the Journal also carries the pictures and the biographies of physicians in the States of California, Oregon, and Washington, who have pioneered in tuberculosis work in their respective states We pay tribute to these pioneers of medicine, and only regret that we do not have the space available to include the biographies of many more of the eminent physicians who have been pioneers in this great cause

It is the purpose of the Editorial Board of *Diseases of the Chest*, to eventually compile similar issues for each of the forty eight states and the District of Columbia, either through the publishing of the data from single states or in groups of states, as was done in this instance With the publication of this issue, ten of the forty eight states will have been completed

The Editorial Board of *Diseases of the Chest*, expresses its appreciation to the State Committees under whose direction this issue of *Diseases of the Chest* was compiled, and also to the officials of sanatoria, tuberculosis societies, and to all of the other individuals and agencies that cooperated to make this issue of *Diseases of the Chest* possible

—F W B

EDWARD
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HAYES, M.D.

— PRESIDENT —

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DR EDWARD WILLIAM HAYES was born July 4, 1883 at Millville, Minnesota where he spent his early years. He received his academic training at Carleton College, Northfield, Minnesota and his medical education at the University of Minnesota Medical School where he graduated in 1913. For the next few years he practiced general medicine in Minnesota until he broke down with tuberculosis in 1918 and was forced to give up his practice temporarily. He entered the Trudeau Sanatorium at Saranac Lake, New York. Here he became interested in tuberculosis as a specialty and, after taking work in that line at the Trudeau School, he went to Arizona where he remained two years, devoting his practice to diseases of the chest. Since 1922 he has been located at Monrovia, California.

Dr Hayes has been a leader in the medical developments in the handling of tuberculosis and has taken an active part in the study and improvement of methods of its

prevention, diagnosis and treatment. He has written rather extensively on the various phases of the tuberculosis problem, particularly with reference to the treatment of this disease.

At the present time, Dr Hayes is a member of the staff of the Los Angeles County General Hospital in the department of Diseases of the Chest, he is associate professor of medicine in this same department in the College of Medical Evangelists of Los Angeles and he is Chief of the Department of Diseases of the Chest in the Orange County and the San Bernardino County Hospitals. He is engaged in private practice in Monrovia where he is Medical Director of the Maryknoll Sanatorium, an institution of about fifty beds, owned and operated by the Maryknoll Sisters. He has been a Fellow of the American College of Physicians since 1927 and in June, 1937, he became president of the American College of Chest Physicians.

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MRS EDYTHE TATE THOMPSON Sacramento

FOREWORD

TUBERCULOSIS has always constituted an important Public Health problem in California. When the migration of white men to California began, this state's tuberculosis problem appeared, and it has been present continuously for almost a century. During the last few decades, the prevalence and mortality from this disease has been greatly reduced, but the death rate from tuberculosis in California is still, today, higher than that of most other states.

The Anti-tuberculosis League was organized in California in May, 1902, with Dr F M Pottenger, Sr as president, several years before the National Tuberculosis Association was started, and has grown to be the largest and most important unofficial public health organization in the state. It was mainly through the efforts of Mrs Edythe Tate Thompson, then secretary of this organization, that the tuberculosis subsidy bill was passed in 1915. This law has served as the impetus for the development of the system of state subsidized county sanatoria which now serve nearly all of California. More than twenty such sanatoria receive substantial subsidies, totaling millions of dollars annually, from the state under this policy, and in return the State Bureau of Tuberculosis insists on their maintaining a high standard of care for the patients.

In the pages of this section will be presented only a few statements regarding some of these institutions and the work they do.

Lack of space and insufficient funds have prevented the editors from publishing pic-

tures and histories of all of the sanatoria in California. It is our hope that the many tuberculosis workers visiting California this year may find opportunity to become better acquainted with our activities, and that by mutual exchange of experience we may both profit.

WELCOME TO THE WEST

The sage advice "Go West, Young Man," followed by so many seekers for fortune and adventure in the early years, and later by the no less earnest seekers after health, may well be followed this year by those interested in learning about tuberculosis, since this year for the first time in history the American Medical Association, the National Tuberculosis Association, the American Sanatorium Association, the American College of Chest Physicians, and other organizations engaged in the battle with the White Plague are all meeting within the same state of California in well timed succession.

It is hoped that this little journal may help to introduce our visitors to the resources available for this campaign in the Pacific Coast. May the meetings here be pleasant and profitable and the time outside of the business sessions give a glimpse of the natural advantages and hospitality of the West.

PIONEERS IN TUBERCULOSIS WHO ARE STILL CARRYING ON



JOHN C KING, M.D.
1853 —

DR JOHN C KING was born at Pittsburgh, Pennsylvania, on February 9th, 1853. After ten years of medical practice in the East he contracted tuberculosis. Given a year to live, he came to Banning, California, in September, 1883, bringing a friend with him who promised to take care of the burial details.

He bought the Banning general store and took this friend in as a partner. He was postmaster for two years and the first local fire insurance agent.

Dr King performed capital operations on kitchen tables, emergency operations on the bare ground, far from water, and amputations in box cars, by lantern light, with train crews assisting.

Dr King was President of the San Bernardino County Medical Association, and later of the Riverside County Association. He was President of the Southern California Association and also of the State Association. He was a member of the Board of Medical Examiners for several years and became its President. Today, a memorial library is dedicated to him, housed in the Riverside Public Library.

He founded the Banning Hospital and Sanatorium for the tuberculous which still carries on his work under the direction of Dr A L Bramkamp, his former associate. He distributed circulars all over the United States advertising Banning's claims as a health resort and thus contributed largely to the development of the community.

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CHARLES CLIFTON BROWNING, M.D.
1861 —

CHARLES CLIFTON BROWNING was born in Denver, Illinois, May 25th, 1861. As a small boy he lived through the trying days of the reconstruction in a section where there was much division of opinion and sympathy. He received his degree from the University of Missouri in 1883, and returned to his home to take up practice. In 1885 he married Helen Tillapaugh of Denver, Illinois. He later went to New York and was on the Staff of the City Asylum for the Insane from 1888 to 1891. Developing tuberculosis, he moved to California in the latter year. After a rest of some months he resumed his practice and for several years carried on in the face of active lesions, which must have been at times of the florid type. He finally became interested in tuberculin therapy and attributed his arrestment to this agency. Probably this was the basis for his continued belief in its therapeutic value, though he was always conservative in his administration of it.

Ever since his recovery he has been active in tuberculosis work. He was one of the leaders of the public education when that was first started in this state, and was a very active member of the Tuberculosis Commission which made a study and report to the State Legislature in 1913. In 1914 he was elected president of the California Tuberculosis Association, and served for four terms. He has also been president of the Los Angeles Tuberculosis Association and the Los Angeles County Medical Association. For many years he served as director of the National Tu-

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PIONEERS IN TUBERCULOSIS WHO ARE STILL CARRYING ON



FRANCIS MARION POTTENGER, M.D
1869 —

DR FRANCIS MARION POTTENGER was born on a farm near New Baltimore, Ohio, September 27, 1869. He attended the public schools at New Baltimore, Ohio, graduated at Otterbein College, Westerville, Ohio, with degree of Ph.B in 1892, receiving degrees of Ph.M 1897, A.M 1905, LL.D (honorary) in 1909. He graduated at Cincinnati College of Medicine and Surgery in 1894, and took post-graduate medical courses in New York in 1900, European clinics (Vienna, Berlin, Munich, London) in 1894, 1905, 1907 and 1909. He began the practice of medicine in Norwood, Ohio, in September, 1895.

Teaching positions held Assistant to the Chair of Surgery, Cincinnati College of Medicine and Surgery, 1894-95. Professor of Clinical Medicine, Diseases of the Chest, University of Southern California, 1903-4, 1905-1909, 1914-1920, and from 1931 to the present date.

In 1902 he was instrumental in establishing the Southern California Anti-Tuberculosis League, the ninth organization for the prevention of tuberculosis in the United States, which was established two years before the National Tuberculosis Association. He was its first President and served until 1906. The Southern California Anti-Tuberculosis League was eventually merged into the California Tuberculosis Association, of which he was President in 1931-32, and has served on the Board of Directors since 1930.

He established the Pottenger Sanatorium at Monrovia, California, in 1903, of which institution he is the medical director.

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ROBERT A PEERS, M.D
1875 —

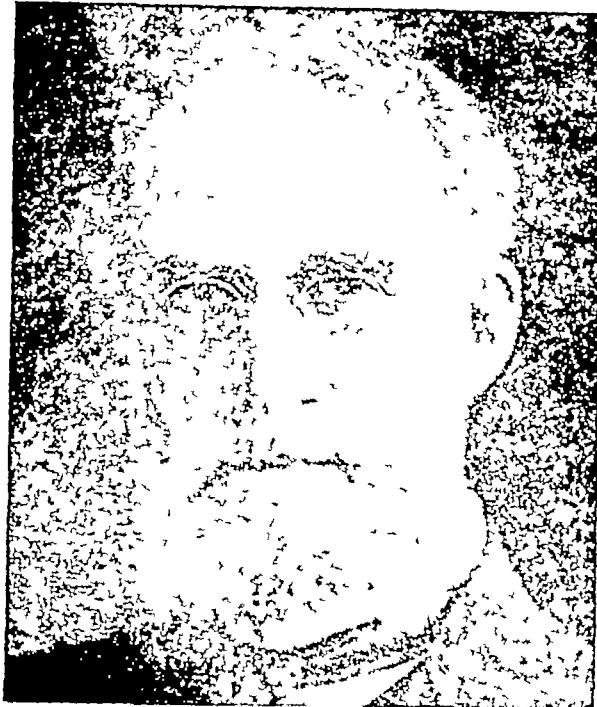
DR ROBERT A PEERS was born in Woodstock, Ontario, of hardy English stock on December 13, 1875. After receiving his primary schooling in the grammar schools of Woodstock, he entered the Woodstock Collegiate Institute, leaving after a period to matriculate at Albert College, Belleville. Dr Peers received his C.M and M.D from Trinity University, Toronto, in 1899 and was made a Fellow of the Trinity Medical College in the same year (F.T.M.C.)

After receiving his degree young Peers immediately commenced practice in Colfax, California. Here he observed that chronic chest cases were constantly being attracted by the favorable climate. Recognising that these patients deserved the care of a competent specialist, he began the intensive study of tuberculosis and since 1909 has devoted himself exclusively to the care of patients suffering from this disease. As the result of natural advantages and skillful medical care, the reputation of Colfax as a health resort spread rapidly until Dr Peers was Medical Director of one of the largest, privately owned, tuberculosis sanatoriums in the country.

Chief among Peers characteristics have been his warm, personal friendship toward the patients and the attitude he has chosen, embodying the attributes of physician and teacher to almost equal extent. From time to time young physicians, who have broken down with tuberculosis and who have sojourned at the Colfax School for the Tuberculous, have been listed among its graduates and have gone to various

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PIONEERS IN TUBERCULOSIS WHOM WE COMMEMORATE



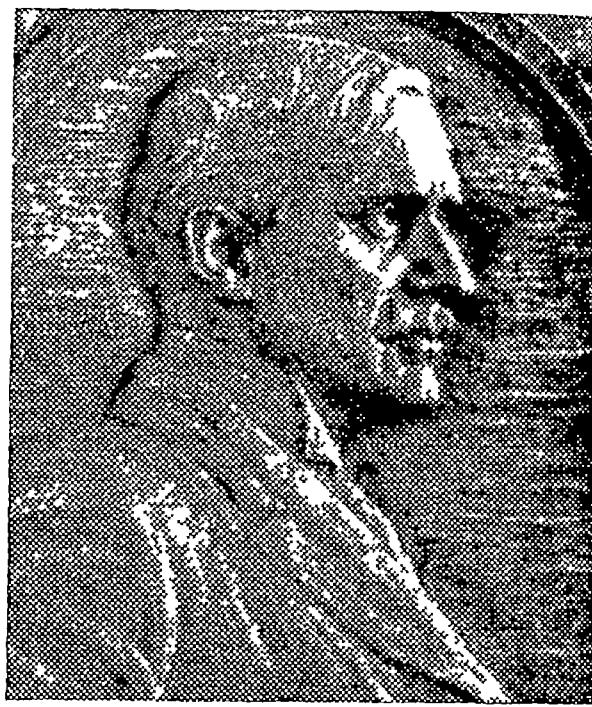
NORMAN BRIDGE, M.D.

1844 - 1925

NORMAN BRIDGE was born in Vermont in 1844. Dr Bridge received his general education in country schools and in the High School of DeKalb, Illinois. He then taught in a country school for a time. He began the study of medicine in 1865, attending the Medical Department of the University of Michigan and later graduated at the Northwestern University in 1868 with the degree of M.D. From the time of his graduation he began to teach medicine and for more than 30 years his name appeared on the faculty of some medical college, first in his Alma Mater, then in the Womens' Medical College and after 1874 at Rush Medical College.

His health broke down and while searching with his own microscope he found the tubercle bacillus in his sputum and gave up his work and came to Sierra Madre in Los Angeles in 1890. Later he opened an office in Los Angeles. Increasing interest in the oil business, in which he made quite a fortune, caused Dr Bridge to give up his active practice, but he retained considerable interest in professional affairs. He published four books, one of which contained his lectures on tuberculosis. His autobiography "The Marching Years" describes his oil activities in which he made several million dollars, which was later left, in great part, to public institutions, including several tuberculosis sanatoria.

—E B



HENRY B. STEHMAN, M.D.

1852 - 1918

"ONE of the Noblest of Men, a Great Physician, A Great American and a Great Christian" —These are the words on the memory tablet on the walls of the new and beautiful *La Vina Sanatorium* originally founded by Dr Stehman.

Dr Henry B. Stehman was born in Pennsylvania in 1852. Graduated from Lebanon Valley College, studied for several years in Leipzig and Brussels, on his return entered Jefferson Medical College from which he graduated in 1877. His internship was at Blockley. After practicing medicine several years in Lancaster, Pennsylvania, he was called in 1884 to the Presbyterian Hospital of Chicago as Superintendent. The Presbyterian Hospital expanded rapidly under his executorship, but too much of his health went into that growth. Breaking down, Dr Stehman came to California in search of health, opening an office in the city of Pasadena, while convalescing. He soon realized the great need for a rest home for the tuberculous and interested many friends and citizens of Pasadena who contributed toward the purchase of 240 acres in the beautiful foothills of Pasadena. Other friends contributed individual cottages and *La Vina* was founded as a semi-endowed non-profit institution and formally opened in 1909. Many patients have received treatment and Dr Stehman continued his noble work until the year of his death in 1918.

—W A H

PIONEERS IN TUBERCULOSIS WHOM WE COMMEMORATE



WALTER JARVIS BARLOW, M.D.
1868 - 1937

WALTER JARVIS BARLOW, M.D., came to California in 1895, suffering from pulmonary tuberculosis. He began the practice of medicine in Los Angeles two years later. He restricted his practice to Internal Medicine and naturally showed an early interest in diseases of the chest. In 1904 he founded the Barlow Sanatorium which has gradually grown to an institution of 100 beds. Admission has been restricted to those of moderate means, residents of Los Angeles County or natives of the State of California. From its inception the Barlow Sanatorium has been maintained as a semi-charitable institution with minimal charges which cover but a small percentage of the patients' care. The remainder of the cost has been met by private donations or bequests, which have almost all been acquired through Dr. Barlow's personal efforts.

Dr. Barlow also founded the first medical library in Los Angeles, which was known as the Barlow Medical Library until 1934, when the publications were all transferred to the Los Angeles County Medical Association. The work has since been carried on by the County Association with these books and periodicals forming the nucleus for further expansion.

From 1908 to 1914 Dr. Barlow was Dean of the Los Angeles Medical Department of the University of California, where he occupied the chair of medicine for many years.

With these philanthropic and educational activities, Dr. Barlow possessed a large private and consulting practice, which, however, did not pre-

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MAX ROTHSCHILD, M.D.
1871 - 1936

DR. ROTHSCHILD was born July 10th, 1871, at Hoffgelsmar, Germany, and educated at the Universities of Kiel, Heidelberg and Berlin, being graduated by the Board of Examiners of the University of Berlin in 1896. After a year of post-graduate study at Berlin in tuberculosis he came to San Francisco, arriving in 1899, to practice medicine.

In San Francisco he met Dr. Fehleisen, the discoverer of the streptococcus of erysipelas, whom he had known in Europe—and together they had many enjoyable rambles about San Francisco, as Dr. Rothschild delighted in telling. Their bear hunting experiences in the Ingleside District of San Francisco will always remain classics.

After several years of general practice he devoted himself exclusively to the treatment of tuberculosis and pulmonary conditions. In association with Dr. Harry C. Warren he opened the California Sanatorium at Belmont in July, 1919, which has developed into one of the largest institutions for the treatment of tuberculosis in the West.

Professionally he was always alert to new ideas, being the first clinician in America to induce artificial pneumothorax for pulmonary compression. He and Dr. Fehleisen obtained the first reports of Forlanini's work in Italy and constructed a pneumothorax apparatus. He was also one of the first advocates of phrenic nerve interruption and a pioneer in the use of tuberculin. He early discovered that dosage was the important factor in treatment and if controlled to avoid reactions.

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PIONEERS IN TUBERCULOSIS WHOM WE COMMEMORATE



WILLIAM H. BUCHER, M.D.
1874 - 1934

WILLIAM HENRY BUCHER was born in Sunbury, Pennsylvania, January 1, 1874, and graduated from the Medico-Chirurgical College in Philadelphia in 1896. As surgeon in the United States Navy he devoted more than a dozen years to establishing the finest kind of friendly relations with the people he encountered all over the world. Volcanoes, earthquakes, floods, famines, plagues and pestilence were all met by a sympathetic understanding and quiet effectiveness that endeared him to those with whom he came in contact.

Pulmonary tuberculosis compelled him to retire from the Navy and regain his health in Colorado and Arizona. A growing private practice was then interrupted for further naval service as Lieutenant Commander of the Naval Hospital at San Diego and then for an adventurous experience as Medical Director of the Central Division of the American Red Cross Mission in Siberia. The last fifteen years of his life were given to building up at Olive View, California, the sanatorium for indigent consumptives of Los Angeles County, as its superintendent.

Dr. Bucher was not a prolific writer nor a frequent speaker. A deep thinker, who weighed his words and ideas carefully, his chief contributions are to be found in the work he accomplished and in the effect of his example on those about him. Many of his experiences and reflections, taken from his diary and from contributions to the sanatorium paper and other writings, were published, posthumously, in the book

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MUNFORD SMITH, M.D.
1891 - 1937

DR. MUNFORD SMITH, born December 2, 1891, in Pittsburgh, Pennsylvania, graduated from the University of Maryland Medical School, and later made his home in Los Angeles. In 1920 he became Assistant Resident Physician at the Barlow Sanatorium and was continuously connected with the Sanatorium from that time until his death, occupying the position of Medical Director for ten years.

Dr. Smith was an unusually able clinician with a wide experience in diseases of the chest, possessing rare judgment in the various methods of treatment for patients suffering from pulmonary tuberculosis. He was also frequently called upon for expert opinion in medico-legal problems by insurance companies and before the California Industrial Commission. In this last connection he was a recognized authority on the results of inhalation of dust and noxious gasses.

He has written many papers on the effects of silica and other dusts in relation to compensation for disability. These papers have been widely published.

He was a member of the Los Angeles County Medical Association, a fellow of the American Medical Association, and a fellow of the American College of Physicians. He was a member of the Board of Directors of the National Tuberculosis Association, and it was while completing his term as President of the American Sanatorium Association that his career was cut short by death June 28, 1937.

—H. W. B.

Pneumoconiosis, Non-Siliceous

J J SINGER, M.D., F.A.C.P.

Los Angeles California

FROM the wealth of material published during the last few years on pneumoconiosis, one is impressed with the preponderance of evidence that silicosis is the one kind of involvement which produces clinical symptoms and definite roentgenological changes in the lungs.

It is true, however, that the other forms of pneumoconiosis such as anthracosis, siderosis, and asbestosis, and those due to organic dust such as cotton, jute, and hemp contribute their share of patients with respiratory diseases.

The medical-legal aspect of pneumoconiosis is of such importance to the physician, industrial worker, and to business in general that a great deal of experimental work was done to see if remedies for pneumoconiosis could be developed. Thus far none have been found except the prevention of dusty atmospheres for workers.

The pathological condition found in the lungs varies with the amount of *dust inhaled per unit of time*, secondly, with the *chemical and physical property* of the dust inhaled, and thirdly, the *individual himself*.

The changes in the lungs, when pneumoconiosis develops, are usually fibrosis in greater or lesser extent, there is bilateral involvement. It begins with small nodules of gray fibrous tissue—the tracheo-bronchial lymph nodes are usually pigmented and at times are calcified around the periphery. The nodules may become larger with time. In non-siliceous dust disease we may find some fibrosis of the parenchyma but little or no nodulations. The more acute non-tuberculous pulmonary diseases appear to be more prominent in such cases. Thus the high pneumonia rates of Pittsburgh have been ascribed in part to the smoke.

The association of non-silicotic anthracosis, especially, with primary cancer of the lung, has been stressed, and Schneeberg lung cancer is apparently also associated with another type of pneumoconiosis. Recently laboratory workers have also suffered from inhalations of radium with permanent deposition in the tissues.

The distinction between silicosis, characterized by pulmonary fibrosis of an almost specific nature, and non-siliceous pneumoconiosis, characterized by accumulation of dust cells (phagocytes) especially in the regional lymphatics but eventually throughout the lung, without the consequent proliferative reaction, cannot be made too strongly, but the existence and clinical significance of the latter need not be entirely neglected.

The association of silicosis and non-siliceous pneumoconiosis as in anthracite coal anthraco-silicosis usually is manifested mainly by the silicotic phenomena, but may sometimes show the reverse emphasis. It is difficult to draw the distinction, even at autopsy, between anatomic silicosis or pneumoconiosis, without symptoms, and the clinical diseases, especially when complicated by later infections.

In individuals who work with cement, soft coal, shell dusts, or other dusts, there may be enough SiO_2 in the particular material with which they work that actual silicotic nodules develop.

Microscopically, dust particles are found in the alveoli with some detritus. If there was prolonged exposure one sees pigment-bearing phagocytes filled with carbon particles. Later these cells are found in the interalveolar lymph spaces and in the lymphatics of the interlobar septa. As the accumulation of pigment increases they form lines along the septa of the lobules and the vascular channels and finally small nodules appear at the points of junction of the various lymph channels.

The degree of involvement depends on the amount of silica present in the dust inhaled.

It is important to know that while the accepted view, until recently, was that the sharp edges of the silica particles injured the lung now it is considered that the danger of silica lies in the fact that when it becomes soluble it is a direct poison to the cells (Gardner¹).

Gye and Kettle² also state that their work showed that colloidal silica is a poison to cellular tissue.

Symptoms of pneumoconiosis of various types are all similar, only the degree varies. The most important symptom is dyspnoea on slight exertion, fever, night sweats, and slight hemoptysis.

Any dusty atmosphere may be the inciting cause of some respiratory infection. Some persons may have better pulmonary activity—muscular and ciliary, than others, also those who already have pharyngeal irritation or bronchial catarrh, if they are exposed to considerable dust may develop some pulmonary fibrosis.

Tuberculosis, which is well known as a common disease in the general population, could be present in workers before entering employment in non-siliceous dust establishments. It is not surprising that this disease is aggravated in such atmospheres. It is most important, in preventive medicine, that all workers be examined not only by a physical examination, but also by roentgen ray studies before they are permitted to work.

Cement workers, brick and tile workers, and also those in grain elevator industry, were studied in Canada³ and while the average time of work in these industries was 13 years, no cases of silicosis were found.

The roentgen film in non-siliceous pneumoconiosis is not as diagnostic in a positive way as in the silicotic condition. It is quite evident why this should be so because the shadows produced on the film are due to fibrosis of more or less extent due to silica which involves the lymphatic system beginning at the hilum and extending outward and downward. When the involvement is extreme, large conglomerate shadows are found, usually in the mid portion of the lung fields.

As the non-siliceous dusts do not produce this fibrosis, except when silica is a part of the dust, the only signs are those of fine densities with no nodulations.

Porcelain workers are easily affected by respiratory diseases. When workers have been employed for many years, fine shadowy particles may appear in the film which are relatively soft and the borders are moderately sharp. These shadows are pin-head in size in both lungs and of equal intensity. The bronchial markings may be moderately thickened.

Those who work in clay are not so apt to show evidence of fibrosis, yet when large number of workers are studied, fine mottling in the lung fields may be noted. Clinically, few show signs of disease. It is only after ten to fifteen years of employment that any signs appear. As a general rule, therefore, one can assume that clay workers rarely develop pneumoconiosis.

Cement workers rarely develop any form of pneumoconiosis unless, as stated previously, silica is part of the material used. Lime dust is more or less soluble in the air passage and is easily eliminated.

The solution, however, if workers are employed for many years, may in time produce bronchitis which simulates pneumoconiosis—then linear densities may be present for many years and can easily be detected on the roentgen film.

In the report on silicosis in Germany at the Johannesburg International Conference³, a significant statement is found, which is as follows: "The mortality rate for cement factory workers showed no difference from that for the local population at the same ages, but rather remained considerably under the average for the district, the tuberculosis mortality rate in particular was within ten years under the average for the whole Bavarian population."

When one is confronted with the problem of an interpretation of a roentgen film as to whether pneumoconiosis is present or not, the density and location, the sharpness of outlines of shadows must be considered. It has been found by statistical studies of thousands of films that occupational groups who have been exposed to substances rich in free silicic acid (sandstone, porcelain—quartz, etc.) show the most dense shadows, nodulations and sharpness of detail—while those groups who work with the non-siliceous dusts show only faint shadows, no nodulation and frequently no abnormal findings.

Asbestosis is a form of non-siliceous pneumoconiosis which has received a great deal of attention, especially in England. It is, of course, important to know the history of exposure to asbestos dust. According to Wood and Gloyne⁴, the patients have an earthy complexion and a slight violet tinge in their cheeks and lips. The physical signs are not

noteworthy other than dry, fine rales in the bases. The roentgen film, however, shows a fine fibrosis affecting the lower lungs, it appears as if the lines are etched into the film. The exact diagnostic significance of asbestos bodies in the sputum is doubtful because the dust particles may have been only in the larger bronchi. But if fibrosis is found in the bases, linear in outline, and there is a history of exposure and symptoms of dyspnoea, the diagnosis of asbestosis is warranted. It is suggested that the only treatment of this condition is in the early stages and then the only thing recommended is to discontinue this type of employment. When exposure has been prolonged the usual complications are septic bronchitis, bronchopneumonia and pulmonary tuberculosis.

The pneumoconiosis of the coal miners and those who develop so-called siderosis is important, because from the roentgen pictures alone one might be confused as to whether silicosis is present. Strange as it may seem, some of the most advanced cases of pneumoconiosis of this type have little or no dyspnoea and are able to work for years. If

the silica content of the coal is high then of course silicosis may develop.

In the dusty atmospheres associated with cotton, jute, and similar products, the irritation produced in the respiratory tract is relatively mild except in certain individuals. The dust particles are too large to be inhaled deeply into the lungs, but tracheo-bronchitis is not uncommon.

Conclusions

1 Non-siliceous pneumoconiosis is often a debatable condition in particular workers.

2 Fibrosis in non-siliceous cases is mild compared to silicotic involvement.

3 Respiratory diseases, such as bronchitis, emphysema and even tuberculosis may be complicating factors in pneumoconiosis of non-siliceous type.

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- 4 Wood, W Burton and Gloyne S Roodhouse Lancet, Dec 22 1934, page 1383

Mucosal Tuberculosis of the Bronchi and Trachea

PAUL C SAMSON, MD, FACS *

Oakland California

ACCORDING to the best pathological evidence available, tuberculous tracheobronchitis is always secondary to pulmonary tuberculosis and is caused by contact with bacillary sputum. Mucosal tuberculosis was recognized by pathologists over 100 years ago, but prior to 1931 clinical case reports were extremely rare. We now know that tuberculous tracheobronchitis is relatively common. Recently, 272 sanatorium patients with adult pulmonary tuberculosis consented to bronchoscopy as part of the routine work-up on admission. Eleven per cent were found to have active or healed mucosal lesions.

The importance of recognizing these lesions clinically lies in the fact that often their presence materially alters the prognosis. The author is strongly convinced of this through

his personal experience with more than 100 cases. In patients with advanced mucosal disease, complete control of the pulmonary tuberculosis is not necessarily sufficient, since well-established bronchial and tracheal lesions can be self propagating. We have repeatedly seen patients die as a direct result of extension of the mucosal tuberculosis even when the pulmonary tuberculosis was being adequately handled.

Mucosal disease may be suspected by the presence of untoward symptoms and by a careful study of serial roentgenograms of the chest.

The symptoms of most significance are persistent oral wheeze and rhonchi, asthmatoïd attacks, paroxysmal or intractable cough with difficult expectoration, dyspnea in spite of a good vital capacity, exceptionally tenacious sputum, feeling of lodgement of

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sputum, sputum persistently positive for acid-fast bacilli in spite of control of the pulmonary tuberculosis, unexpected fever, usually associated with sudden decreases in the amount of sputum

Roentgenographically, various types of *atelectasis* are associated most frequently with mucosal disease. These consist of lobar and subtotal atelectasis either preceding or following collapse therapy, and intermittent atelectasis. A "tennis-ball" or "balloon" cavity (often containing air under positive pressure) usually results from the expiratory check-valve action of a partially obstructed lobar or tertiary bronchus. A similar mechanism may explain the failure of a cavity to collapse in spite of an apparently adequate pneumothorax. Rapidly changing cavities and the non-expansion of a lung after cessation of pneumothorax also may be due to mucosal disease with partial obstruction.

The correlation of symptoms with roentgenographic findings is of particular importance. In the routine bronchoscopic study referred to above over two-thirds of the group with mucosal lesions had both suspicious roentgenograms and clinical symptoms. Considered separately, suggestive roentgenograms are a more accurate index of the presence of disease than are symptoms.

The patient who presents any of the symptoms or roentgenographic changes enumerated above is entitled to a bronchoscopic examination. This is the final important step in diagnosis. Contrary to former general opinion, bronchoscopy is not contraindicated in cases of active pulmonary tuberculosis and no harm results if the examination is done skillfully. Bronchoscopy should not be performed in the presence of advanced laryngeal ulceration, tuberculous pneumonia or severe hemoptysis from an obvious cavity.

In the stem bronchus the most circumscribed lesions are nearly always unilateral and extrude from a lobar branch. The spread is usually upward into the trachea by direct extension. Bronchoscopically, several types of lesions may be recognized, more than one of which may be present in the same patient.

In the *submucosal* or *nonulcerative* type of infection there is localized congestion, edema and granularity of the mucosa. The area bleeds easily. Discrete yellowish submucosal tubercles or elevated tuberculomas may be

seen.

A more severe form of infection is the *ulcerative* type. Obstructing masses of granulation tissue may or may not be present. These lesions can be self-propagating even in the absence of pulmonary activity. Experience has shown that collapse therapy often has no beneficial effect on ulcerative mucosal tuberculosis.

The healing of active mucosal lesions does occur and if the infection is originally circumferential in the bronchus or trachea, a *fibrostenosis* results. This may be localized. Occasionally, the patent bronchial lumen may be greatly obstructed by a tortuous scar-tissue tunnel, one or more centimeters in length. When the healing process is only partial, an *ulcerofibrostenotic* lesion may persist over a long period of time and successful treatment is very difficult.

The bronchoscopic differential diagnosis involves consideration of non-specific bronchitis, neoplasm, syphilis, rhinoscleroma, erosion from lymphatic glands, various forms of compression stenosis, and asthma. The bronchoscopist should be aided by familiarity with the history, roentgenographic and laboratory findings. We feel that biopsy of suspected tuberculous mucosal lesions is dangerous. Serious extensions of the pulmonary tuberculosis have followed this procedure. If, however, some means of cautery for the biopsy area is immediately available, the forceps removal of obstructing tissue may be warranted. If the evidence suggests that the visualized lesion is not tuberculous, a biopsy should be procured.

The treatment of mucosal tuberculosis at present is not entirely satisfactory because of inadequate clinical experience. We do know that serious consideration should be given to bronchial and tracheal lesions. Local treatment may be essential prior to, or during pulmonary collapse.

In general, the *submucosal* type of infection will heal if the pulmonary tuberculosis is brought rapidly under control. This is not necessarily true of ulcerative lesions. The former symptomatic use of atropine, epinephrine, ammonium chloride and autogenous sputum vaccines now has been discarded as useless. Likewise, tuberculin therapy has not proven of value.

The best results today are being obtained

by local cautery of ulcers and granuloulcerative lesions, combined with collapse therapy for the pulmonary tuberculosis. The use of silver nitrate has been recommended, but the author's strong personal preference is for high-frequency electro-cauterization. Specially constructed insulated electrodes of small diameter are used through the bronchoscope. We feel that much greater accuracy of treatment can be obtained in this manner. The results have been gratifying to date. Three to five treatments are usually given at intervals of from two to four weeks. Obviously this method cannot be used if the lesions are inaccessible to the bronchoscope, i.e., ulceration distal to a stenosis.

Ultraviolet has proved disappointing in the attempted control of localized granuloulcerative lesions. Pathological studies have shown, however, that a diffuse microscopic tuberculous infection of the trachea and involved bronchus often accompanies the more localized gross disease. Ultraviolet therapy may, therefore, be of great benefit as an adjunct to local cautery. This possibility is being further explored at the present time.

The use of roentgen radiation should be mentioned. At times, patients are seen in whom both ulceration and stenosis are present. Local treatment is impossible because the active disease cannot be reached. In a series of these patients, the use of roentgen therapy in divided doses has caused regression of the active lesions. In several an increase in troublesome fibrostenosis has been observed. Acute mucosal tuberculosis should not be treated by roentgen therapy.

Bronchoscopic bouginage is the treatment of choice in pure fibrostenosis. Retained secretions are aspirated and the mucosa thoroughly shrunken with equal parts of 10 per cent cocaine and 5 per cent ephedrine. One to three dilatations may be all that are necessary and with an active collapse pro-

gram for the pulmonary tuberculosis a cure may be expected. Occasionally, partial dilatation of an obstructed lobar bronchus can be accomplished by means of a curved vertebrated aspirator. In cases with a lengthy tortuous stenosis relief from obstructive symptoms may not be obtainable by dilatation, and thoracoplasty usually is futile, if not actually harmful. Lobectomy or pneumonectomy must be considered instead. Such lesions may be found unexpectedly and in several clinics bronchoscopy is now a routine procedure before thoracoplasty finally is decided upon. Fibrostenosis of the trachea is very serious and attempted dilatation with solid bougies has not been successful. Graduated sized bronchoscopes can be used with some success. Often one must commence with the 4 mm instrument. Dilatations can be repeated in from ten to fourteen days, but no more than three bronchoscopes should be passed at one operation.

Summary

In summary, mucosal tuberculosis of the bronchi and trachea is a complication of active pulmonary tuberculosis which often may have serious consequences. Hence, its recognition is of importance. Clinically tuberculosis tracheobronchitis may be suspected by the correlation of suggestive symptoms and roentgenographic findings. With few exceptions, bronchoscopy should be used as the final step in diagnosis and as a guide to therapy. To date, the writer has obtained his best results by the use of high frequency electro-cauterization. Special electrodes have been designed to be used through the bronchoscope. Finally, lobectomy, pneumonectomy or external drainage of a tuberculous cavity occasionally must be considered in dealing with the secondary effects of high grade bronchial obstruction.

ANNOUNCEMENT

Dr Max Pinner has been appointed chief of the Division of Pulmonary Diseases in Montefiore Hospital, New York, and will assume his duties on September 1.

Dr J Burns Amberson, Jr., has been appointed a member of the consulting staff of this division.

tive There has been no sputum since February, 1938 The cavity is closed by x-ray and the patient has been ambulatory since October, 1937, and at full-time work since January, 1938

Discussion This illustrates the fortunate occurrence of the closing of an apical cavity with the combined use of a phrenic operation plus pneumoperitoneum These procedures were initiated particularly with respect to the acute exudative involvement in the right upper lobe Such a marked rise in the diaphragm occurred and the mechanics of the chest were so altered, that closure of the cavity resulted Whether this was from pressure, from relaxation of fibrous tissue, or changing the contour of the bronchus draining the cavity, is not clear The final result is none the less satisfactory

It is planned to continue this pneumoperitoneum on the present basis for at least another year The temporary phrenic still paralyzes the diaphragm This man's general physical condition is such that he would stand major surgery poorly, and the combination of methods used has resulted in a good clinical result

(4) *M G L*, age 20, white male Native of Scotland Occupation, bookkeeper

No tuberculosis contact known July, 1936, had severe left pleuritic pain No medical attention Recurred in November, 1936, associated with malaise and temperature to 104°F, lasting one week This was considered by physician as pneumonia He remained at bed rest for 2½ months, and returned to work in January, 1937 One month after this first attack, a similar episode recurred for which he remained in bed 6 weeks September 15, 1937, he noted malaise, and recurrence of his left-sided pain

When seen by us at that time he had a low-grade fever, no loss of weight, excellent general condition X-ray showed bilateral infiltration of both upper lobes without cavity formation No sputum obtainable Stomach wash was positive for tubercle bacilli by guinea pig inoculation

A period of institutional care with absolute bed rest for 2 months beginning October 14, 1937 During this time an attempt was made to start first a left, then a right artificial pneumothorax without success, because of obliterative pleuritis The patient had great

difficulty in settling down to a hygienic regime Both he and his family seemed to lack the background necessary to take the cure properly In their experience, tuberculosis had always been a fatal disease, and their fears regarding this patient were extreme Because of finances, only a short stay in a private sanatorium was possible, and public sanatorium care was absolutely refused Pneumoperitoneum was initiated November 8, 1937, with excellent technical result The patient has been kept at absolute bed rest until this time

Discussion From our previous experience with patients of this type, it would seem it is quite impossible for them to follow a hygienic regime over any period of time Whether the good result obtained from pneumoperitoneum in this type of patient is on the same basis as some men ascribed the use of tuberculin many years ago, that is, "the laying on of hands," and the necessity for periodic reporting for a definite procedure, was its greatest virtue, is, of course, open to question It is difficult to describe the exact clinical picture and relations in this family, but I seriously question whether an absolute bed rest regime alone would have been possible here

The question as to whether pneumoperitoneum is too serious a procedure to initiate in this type of tuberculosis may also be raised Extensive bilateral lesions, which are slowly infiltrating over a period of 18 months, in a 20 year old boy, who is not particularly cooperative, is a problem that requires drastic action of some type It is perfectly true that this type of lesion, under prolonged bed rest, will usually give us an excellent permanent clinical result I believe that is by all means the best method of approach I further believe that no other method should be undertaken lightly But it is also very important to be keenly aware of not only the physical, but psychological problems involved in the individual patient Where there is rather definite assurance that some other measure will be necessary, in our hands at least, pneumoperitoneum has proven a satisfactory tool in this type of case I do not believe that it should be widely used for this indication, but when necessary, we have no hesitancy in advising it It may well be that some other method may prove just as satis-

factory

We have previously reported certain cases that with the use of pneumoperitoneum have been interesting clinical cures, that is, with the use of pneumoperitoneum alone the cavity has been closed, sputum rendered negative, and the patient returned to a full-day's work at his previous occupation. Such results continue to be found occasionally, but are not the rule, particularly with regard to closure of the larger cavity.

At the other end of the clinical picture there comes a point where no therapeutic measure at our command seems to be indicated. It would seem that pneumoperitoneum can be used in a patient who is more seriously ill with bilateral pulmonary tuberculosis than any other measure, except the fundamental one of bed rest under proper sanatorium conditions. I hope that no statement we have made would tend to minimize the value of absolute bed rest in an adequate institution. However, we must recognize that while this alone occasionally will produce dramatic results, it has been our personal experience, as well as that of most of the clinicians who have tried pneumoperitoneum

on a sufficient scale, that the results with pneumoperitoneum compared to the results without its use justify its continuance.

To date we have given over 5000 refills in some 250 cases. Out of 46 deaths, 20 autopsies have been obtained, and a study is now in progress of the pathology of the peritoneum. On the basis of these findings, we have found nothing to change our previous opinion of the use of this procedure where it is reasonably indicated. We hope eventually to obtain figures that will be statistically significant. It may be necessary to pool cases from various institutions for this purpose. However, one must always compare a procedure of this type with like cases who have received bed rest alone. That should not be a difficult matter, and would give more exact results.

Working more or less as a group locally, and with the added information obtained in other localities where pneumoperitoneum has been used for the last few years, it would seem that our initial favorable reaction toward the results obtained was not mere unwarranted enthusiasm for a new method but that results to date warrant its continued application.

Surgical Resources in the Treatment of Pulmonary Tuberculosis

AMBROSE S. CHURCHILL, M.D., JOHN R. PAXTON, M.D., AND
JANE SKILLEN, M.D.*
Olive View, California

THE day is long past when the treatment of pulmonary tuberculosis might be dismissed with the vague recommendation for fresh air, diet and rest. Each stage and condition in the course of the infection now represents explicit indications for specific forms of surgical intervention, and the correct prescription of such operations has developed into a fine art. Only in the few truly minimal cases, where there is no evidence of progression of the disease under bed rest, is consideration of surgery omitted. Any sign of advancing disease, tissue destruction or cavity is a signal for specific procedures of an operative nature.

Artificial pneumothorax is by far the most popular and most firmly established of the modern active measures in treating tuberculosis. Any patient in whom a successful pneumothorax can be established on the affected side while the other is still uninvolved may indeed consider himself fortunate.

Since the introduction of artificial intrapleural pneumothorax in 1892, by Forlanini, there have been great strides made in the perfection of technique, broadening of indications for its use, better understanding of its contra-indications, and increased knowledge in the diagnosis and treatment of its complications. An incomplete and unsuccessful pneumothorax should be abandoned before serious complications arise, and before

* Surgical Department, Olive View Sanatorium.

valuable time is lost in attempting to make a success out of an unsuccessful pneumothorax

A successful artificial pneumothorax, however, is not now abandoned in the average case merely because there has been a spread to the opposite side To-day some form of collapse therapy may often be instituted on the contralateral side Bilateral intrapleural pneumothorax is no longer considered an extreme measure, nor an exceptionally hazardous undertaking, although its risk is considered greater than that of unilateral pneumothorax

In 1913 Jacobaeus of Stockholm devised a method of severing intrapleural adhesions in an incomplete pneumothorax in which the adhesions prevent a satisfactory collapse of the diseased lung The procedure is widely used to-day by surgeons and has saved many a patient from a thoracoplasty, or other major chest surgery

In cases in which the adhesions are too extensive for safe closed intrapleural pneumolysis but still possible for cutting, the open intrapleural pneumolysis may be used

Pneumoperitoneum or oxyperitoneum was used as long ago as 1900 by Bainbridge Pneumoperitoneum was used primarily in the treatment of intestinal and tuberculous peritonitis, and only in very recent years has it been used in the treatment of pulmonary lesions The results have been gratifying in many cases, particularly from the systematic relief, with a decrease of cough and sputum and gain of weight often experienced Since the early work on phrenic nerve paralysis, and especially by the clinical application by Stuertz, Sauerbruch, Goetz and Felix, great strides have been made, both in technique and indications, as well as in combinations with other surgical procedures From the early avulsion, exaeresis or permanent paralysis, although still often used, most American workers have followed Alexander in the use of mere crushing of the nerve and resection of the accessories nerves, the temporary phrenic paralysis or phrenemphraxis Its results, either alone or in combination have made it a valuable procedure in the armamentarium of the surgeon

Another minor surgical procedure to be used alone, or in combination with phrenic nerve paralysis, was Scalenotomy or Scal-

enectomy, proposed by Kochs, Els and Junktendorf in 1930 The operation was proposed to allow the upper ribs to drop downward and inward, particularly when used with phrenic nerve paralysis The operation enjoyed popularity for several years, and although still used in some clinics, it has been generally replaced by other more effective procedures In 1913 Schepelman performed multiple intercostal neurectomies on experimental animals, and Friedrich in the same year performed the operation on a patient with tuberculosis The operation was used to limit the amount of costal movement and decrease the capacity of the chest on that side This procedure, either alone or in conjunction with other measures of collapse therapy, is also now seldom utilized

DeCerenville in 1885 resected portions of ribs of the chest wall to allow collapse of the underlying diseased tuberculous lung, the first thoracoplasty done for the treatment of pulmonary tuberculosis Other early surgeons to do thoracoplasties were Brauer, Friedrich, Wilms and Sauerbruch Through the early work of these pioneers the modern thoracoplasty has been developed With the replacement of the early paravertebral thoracoplasty in which short pieces of all ribs were removed at one operation by the removal of a few ribs, at a stage either in part or total length, there has been a marked reduction in the mortality of the operation

Recent developments in thoracoplasty technique to allow closure of cavities lying close to the midline, or the so-called paravertebral gutter, are the disarticulation of the rib posteriorly and resection of the transverse processes, and apicolysis, or the freeing of the lung from the mediastinum and paravertebral gutter external to the endothoracic fascia, as proposed by Semb, or subfascially as performed by other operators

A similar less extensive operation usually restricted to a definite type of apical lesion is Apicolysis In this procedure a small section of one rib is removed posteriorly and the apex is freed, allowing the lung to drop downward and collapse, leaving a dead space This is an extrapleural pneumolysis, and was first advocated and used by Tuffier in 1891 on a patient with pulmonary tuberculosis Baer in 1910 filled the space with paraffin, the so called Wax Plombage Since this time

many other substances have been suggested and used for the filling of this space, among them being gum - sheeting, rubber bags, gauze, and the pectoral muscle and fat

More recently air has been repeatedly injected into the extra-pleural space instead of wax or other materials Owing mainly to inadequate technique, the first few cases were generally unsuccessful Lately other workers have improved the procedure, making and maintaining collapse sufficiently, and hundreds of cases have been so treated successfully Oil has also been used instead of air in this procedure, especially in cases of diminishing collapse

The most formidable surgical procedures employed in the treatment of pulmonary tuberculosis are lobectomy and pneumonectomy, the removal of a lobe or an entire lung on one side Though rarely utilized, these have a definite place, particularly in cases in which cavity closure and sputum conversion cannot be accomplished by an apparently maximal thoracoplasty or in cases in which advanced tracheobronchial stenosis or obstruction renders surgical "compression" procedures ineffective, or in which the bron-

chial involvement has already lead to the development of a mixed tuberculous bronchiectasis

Tracheobronchial tuberculosis may be recognized by the frequent use of the bronchoscope Every patient should be bronchoscoped before thoracoplasty, extrapleural pneumothorax or pulmonary amputations Any patient who presents any symptoms, physical signs or radiological evidence suggesting tracheobronchial tuberculosis should also receive this diagnostic measure The bronchoscope may also be used for direct therapeutic purposes The treatment of ulcerative tracheobronchial lesions by chemical or electro-cauterization has yielded gratifying results

Pulmonary tuberculosis can not be treated by operative means alone with the neglect of skillful medical management if the best results are to be obtained It is just as important to realize, however, that no patient should be treated, today, for pulmonary tuberculosis without consideration of the possibilities of the varied resources of modern surgery

N O T I C E



The Second Annual Tuberculosis Seminar, at Asheville, will be held July 11-16 The number of physicians to take the course will be limited to twenty and the fee will be \$10.00 Special attention will be given to early diagnosis and to both surgical and medical treatment Outstanding laboratory and clinical facilities are available Applications will be acted upon in the order in which they are received and prompt action is necessary for those who wish to avail themselves of this opportunity



For Further Particulars Write To

KARL SCHAFFLE, M.D.

Chairman, Tuberculosis Seminar

Asheville, North Carolina

California Biographies Continued

JOHN C KING, M.D

(Continued from page 8)

Dr King served on the local school board for twenty-one years. He was instrumental in obtaining a high school for Banning, years earlier than it would have developed by normal growth.

Dr King, at the age of eighty-five, is in comparatively good health and lives in Pasadena, California.

—A L B

CHARLES CLIFTON BROWNING, M.D

(Continued from page 8)

Tuberculosis Association, and is now an honorary member.

In 1910 he took charge of the Tuberculosis Department of the Los Angeles County Hospital, and continued in that capacity until his retirement in 1932. In the early part of the world war he served as contract surgeon. Later, in response to his urgent request for permission to enter the regular services although he was well over the age limit, he was given a special dispensation to enlist. During the influenza epidemic and the balance of the war he was in charge of the Medical Services at Fort McArthur.

Like all the pioneers in tuberculosis in California, his career followed the example of Dr Trudeau in his efforts to help those suffering from tuberculosis who could not help themselves. Certainly it can be said of him "To each he gave the best he had to give."

—C H

FRANCIS MARION POTTENGER, M.D

(Continued from page 9)

Doctor Pottenger has been active in many tuberculosis organizations. He has served on the Board of Directors of the Los Angeles Tuberculosis and Health Association since 1924, President, California Tuberculosis Assn, 1931-32, Secretary, 1937- , and served on the Board of Directors since 1930, member of the National Tuberculosis Association (Director, 1930-34), International Union Against Tuberculosis, American College of Chest Physicians, American Academy of Tuberculosis Physicians, honorary member of the Tuberculosis Society of Scotland.

He is a member of the Los Angeles County Medical Assn (President, 1906-07), Los Angeles Clinical and Pathological Society (President, 1923-24), Trudeau Society of Los Angeles (President, 1935-36), Southern California Medical Society (President, 1912-13), California Medical Association, Pacific Interurban Clinical Club (Chairman, 1931-32), California Academy of Medicine, Hollywood Academy of Medicine (honorary).

Doctor Pottenger is also a member of numerous national organizations: American Medical Assn, Fellow of American College of Physicians (Councilor, 1916-23), Regent 1923-29, and Regent 1933- , President 1932-33, American Thera-

peutic Society (President 1914-15, Councilor since 1906), Association for the Study of Internal Secretions (Secretary from 1917-35, President 1935-37, Councilor 1917-) American Climatological and Clinical Association, American Association for the Study of Allergy, American Public Health Association, American Sanatorium Association (President 1924-25), American Heart Association, Association for the Advancement of Science, Science League of America, Fellow, National Geographic Society, Founder member of the Pacific Geographic Society (Board of Regents 1929-33), American Academy of Political and Social Science, and Institute of American Genealogy. He is a member of the Society of Colonial Wars, and the Sons of the Revolution.

He is consultant, Los Angeles County Hospital, Collis P and Howard Huntington Memorial Hospital, Pasadena, Chairman of Medical Executive Board and Consultant, Los Angeles Sanatorium and Ex-patients Home, Duarte, California. He is Chairman of Tuberculosis Advisory Committee to Department of Charities, Los Angeles County.

He was Trustee of the City of Monrovia, 1899-1900. He has served on the Board of Trustees of Otterbein College, Westerville, Ohio, since 1924.

Doctor Pottenger has always recognized the fact that internal medicine is greater than any specialty. Aside from his interest in tuberculosis he has had special interest in asthma and other allergies, endocrinology and visceral neurology.

He has added many original observations to the clinical side of tuberculosis. In 1909 he described the motor and trophic reflexes in pulmonary tuberculosis, and later classified and described many reflexes from the lung. In 1913 he described the motor reflex from the kidney. (1909) he was the first to describe the ability to palpate deep organs and to outline by touch various pathologic conditions within the thorax ("Light Touch Palpation"). In 1913 he offered a classification for the symptoms of tuberculosis based on their etiology, showing that all symptoms may be classified into three groups (1) those produced by the toxins, (2) those of reflex origin, (3) those due to the tuberculous process *per se*.

He is interested in eugenics, and is a member of the Eugenics Society of the U.S. of America.

He has also been a student of economics and sociology, and is much interested in the problems of the day. At present he is Honorary Chairman of the Medical Bureau to Aid Spanish Democracy (Southern California Chapter), and a member of the National Committee of the American Bureau for Medical Aid to China.

Doctor Pottenger has published more than 250 papers on medical subjects, and the following books:

"Pulmonary Tuberculosis" New York City, Wm. Wood and Company, 1908. The following were

(Continued to page 50)

California Sanatoria



THE POTTENGER SANATORIUM MONROVIA, CALIFORNIA

THE Pottenger Sanatorium for Diseases of the Chest was opened on December 5, 1903. It had facilities for caring for eleven patients. At the present time its bed capacity is 120.

The sanatorium is located at Monrovia, on the southern slope of the Sierra Madre mountains, at an elevation of 1000 feet, overlooking the San Gabriel valley. The Sierra Madre mountains, north of the sanatorium, rise to an elevation of 6000 feet.

Monrovia lies thirty-five miles inland from the ocean and is sixteen miles from Los

Angeles. The climate is moderately dry, midway between that of the ocean and the desert. Monrovia has an all-year-round climate. The summer days for the most part are delightful, and practically every night requires a blanket. The winters are warm and pleasant. Sub-tropical plants grow in the gardens throughout the year.

The sanatorium is situated in the midst of a beautiful park, which adds greatly to the pleasure of the patients.

Close supervision is given by an ample resident medical staff.

California Sanatoria



Florence E Mead Hospital

REST HAVEN PREVENTORIUM

SAN DIEGO, CALIFORNIA

FLORENCE E MEAD, President

REST Haven Preventorium is now and for many years, has been one of the leading and the most important branches of the work being done by the San Diego Tuberculosis Association

Rest Haven Preventorium was opened as a preventorium in 1921 for anemic, contact, and undernourished children, who if unaided were in danger of developing active tuberculosis. These children are admitted after thorough examination in the clinic by one of the staff physicians in charge

The new Florence E Mead Hospital of Rest Haven is built, equipped and maintained in full accord with the most modern medical, sanitary, and architectural standards

Rest Haven Preventorium consists also of a large dining room, with kitchen and store rooms. Three large dormitories with sun porches, two for girls, one for boys and with quarters for nurses. All of these buildings are of modern construction and fully equipped and heated according to state and medical standards

Rest Haven Preventorium has a full corps of nurses and assistants, prompt aid being available at all times for any child needing care. It also maintains an up to date school with grades from kindergarten to junior high, thus enabling the children to continue with their education whilst their health is being restored, two teachers being provided by the San Diego City Board of Educa-

tion. A library and play ground is connected with the institution for use of the children. The average number of beds was sixty-two, but with the new hospital, it will be possible to accommodate one hundred and ten children

The children at Rest Haven, many of them rescued from an unhappy life of suffering, are being restored to health and usefulness by proper food, outdoor life, sunshine, judicious exercise, rest, and proper sanitary care and treatment. In many cases, they are saved from becoming helpless invalids and a heavy charge upon their family and the community. Rest Haven Preventorium is situated one mile and a half east of San Diego, consisting of eleven acres

Amongst the outstanding work of the San Diego Tuberculosis Association is its Early Diagnosis Campaign, carried on each year in the public schools and state college. Tuberculin tests and x-rays being given upon request. All contacts if so ordered by the clinic or by private physicians are admitted to Rest Haven Preventorium. In connection with this Early Diagnosis Campaign and Rest Haven an extensive follow-up work is carried on now by a competent graduate nurse

For further information, write to the San Diego Tuberculosis Association and Rest Haven Preventorium, 1266 7th Street, San Diego, Calif.

California Sanatoria



Tropical Setting of the Administration Building



A View of the Entrance of The Howard Foundation

CALIFORNIA SANATORIUM BELMONT, CALIFORNIA

THE California Sanatorium at Belmont California, was opened in July, 1910—and is located in the Peninsula district twenty-five miles distant from San Francisco, combining the advantages of an equable climate with perfect accessibility to a metropolitan center

From a beginning of twenty beds it has progressively increased its capacity to one hundred and ten beds Having weathered the vicissitudes of pioneer ship it now offers all advantages and modern therapy for respiratory diseases

Within the grounds is the Howard Foundation, a twenty bed endowed institution in which children of

semi-indigent parents are treated without charge Their supervision and treatment being directed by the staff of the California Sanatorium Here many interesting and far reaching experiments and deductions have been made in juvenile tuberculosis

Dr Max Rothschild the founder of the sanatorium was long an advocate of early isolation, augmented by routine supervision as the only practical course to lessen the incidence of tuberculosis With great satisfaction he lived to see this idea accepted universally and a national drive made with isolation as its goal

MARYKNOLL SANATORIUM

MONROVIA, CALIFORNIA



THE Maryknoll Sanatorium is located in Monrovia, California It is eighteen miles east of the center of Los Angeles and is connected with the metropolitan area by several different automobile highways and by the Pacific Electric Interurban Railway The sanatorium is situated in the foothills on a southern slope at the base of the mountains in one of the most delightful all year-round climates in the United States This institution is privately owned and being comparatively small the essential control of the individual patient is not difficult

The Maryknoll Sanatorium was originally established seventeen years ago as a small rest home and has gradually grown to its present capacity of fifty beds It is owned and operated by the Maryknoll Order of Catholic Sisters The accommodations are private and semi-private and all are modern in equipment The rates, including medical attention, vary from thirty to thirty-five dollars a week.

For information address Sister Mary Ellen Superior in Charge or E W Hayes M.D Medical Director

California Sanatoria



BANNING HOSPITAL AND SANATORIUM BANNING, CALIFORNIA

THE Banning Hospital and Sanatorium was founded about 1910 by Dr John C King. From a very small beginning it had a consistent growth to its present capacity for thirty patients. Dr A L Bramkamp, the present medical director, associated himself with Dr King in 1919, and in 1922, Dr King retired from active practice and moved to Pasadena, California, where he now resides.

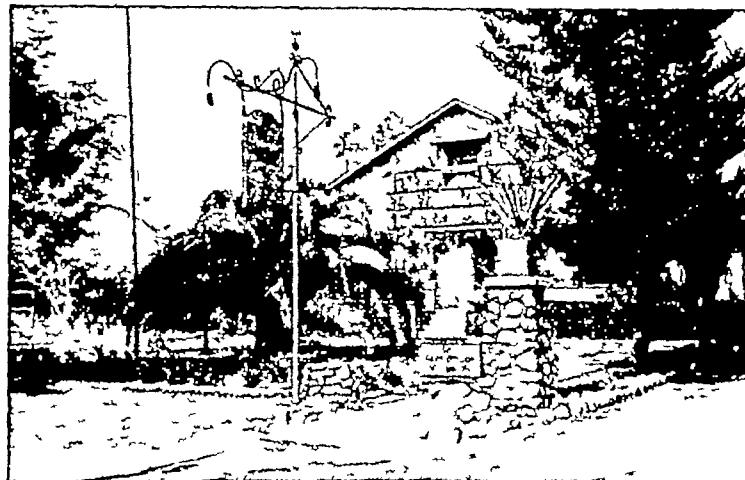
The hospital and sanatorium is equipped for modern

surgery and the cottages which house the patients are constructed to assure patients the utmost comfort and privacy.

Private individual care, in pleasant surroundings, and under competent medical direction can be obtained at the Banning Hospital and Sanatorium.

The hospital is privately owned and the rates which include medical care are very reasonable. Write for attractive booklet.

SOUTHERN SIERRAS SANATORIUM BANNING CALIFORNIA



THE Southern Sierras Sanatorium, Banning, California, was established January 1, 1913 by the late Dr L M. Ryan, who operated the sanatorium on a high scientific plane until about 1919.

Subsequently the sanatorium changed hands a number of times and in 1926 was purchased by Dr C E Atkinson, who at that time had been doing tuberculosis work for thirteen years. Since then Dr Atkinson has served as Medical Director and under his direction the sanatorium has prospered and has earned a sustained reputation for satisfaction.

Dr Atkinson had been in general practice in Los Angeles for several years until his health broke down in

1912. He then moved to Monrovia where he was engaged in tuberculosis work for about two years. In 1915, for health reasons, he came to Banning where he continued his tuberculosis practice and was among those in this country who early recognized the value of artificial pneumothorax as a method of treatment.

With an inspiring view of high mountain peaks on either side the sanatorium is situated about one mile north of Banning at an elevation of twenty-five hundred feet. Amid a general atmosphere of quiet contentment, modern established methods of treatment are availed of fully, and each year the roster shows an increasing number of persons restored to useful and happy lives.

California Sanatoria

CANYON SANATORIUM

REDWOOD CITY, CALIFORNIA

CANYON Sanatorium was founded in 1916 by Dr Ralph B Scheier, the present medical director

The Sanatorium is located three and a half miles from Redwood City San Mateo County, California thirty miles south of San Francisco. Nestled in the foothills protected from the fog and wind the Sanatorium partakes of a natural beauty that lends an atmosphere of contentment so conducive to the mental welfare of the patient. Surrounding the Sanatorium is mountainous country covered with evergreen oaks.

Our cottage plan of construction is ideal. Being favored by a climate that permits living in the open the entire year the individual cottage or bungalow affords an excellent means of enabling the patient to lead a continuous open-air life.

Each patient occupies a separate cottage (except in cases where a mutual combination is agreeable), consisting of a sleeping porch and an adjoining dressing room. All of the cottages are lighted by electricity and provided with telephones and hot and cold running water. Adjustable windows permit a maximum of sunshine and fresh air. Steam heat is available as the weather demands.

Our nursing service provides for a care that is unexcelled. Specially trained nurses carry out the orders of the medical staff and at all times cheerfully administer to the comfort of the patients.



"A Typical Bungalow"

The rates are moderate ranging from \$25.00 per week and upward and include general nursing room and board, all ordinary medication and services rendered by the medical staff.

For further information write Ralph B Scheier, M.D. Medical Director, 516 Sutter St, San Francisco, Calif.



THE OAKS SANITARIUM

LOS GATOS, CALIFORNIA

THE Oaks Sanitarium, located at Los Gatos California two miles south of the picturesque town of Los Gatos and lying in the foot-hills of the Santa Cruz Mountains was twenty-four years old on the first of February, 1938. It started from very small beginnings. When it was taken over by the present management the few tent-cottages existing were demolished and a modern up-to-date institution was built.

The institution has fulfilled its destiny by living up to the slogan by which it came into existence namely "A moderately priced institution for the scientific treatment of tuberculosis." From small beginnings The Oaks Sanitarium has developed into an institution of sixty beds

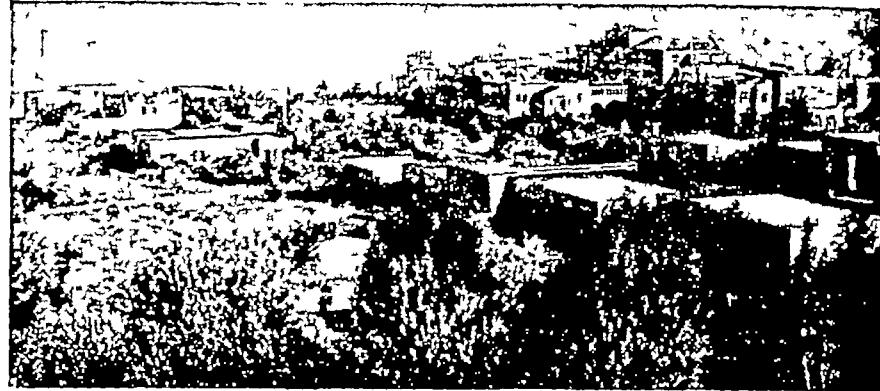
and is thoroughly equipped from a clinical laboratory roentgenological and sociological aspects to cope with all forms of tuberculosis and chronic pulmonary diseases along the most modern and accepted lines of treatment. The Sanitarium maintains in addition to its cottages and other buildings a partially endowed building which houses twenty-two patients and in which patients are accepted at a minimal rate of \$25.00 per week. The Sanitarium also maintains a model farm and dairy. Personal service, good food, and proper medical attention we consider the three reasons for our success. A booklet containing full information will be furnished upon request. William C. Voorsanger, M.D., F.A.C.P. is the Medical Director.

California Sanatoria

VETERANS' HOSPITAL

LIVERMORE
CALIFORNIA

FRANK B BREWER, M.D
Manager



WHEN the Congress authorized the establishment of a Veterans Hospital for the treatment of tuberculosis and its complications in the San Francisco Bay area district, a survey of available sites was made. Climatic considerations were involved, and it was found that the Livermore Valley presented conditions more nearly approaching those considered ideal than any available section. Nestled on a plateau in the Livermore mountains, the Livermore Valley enjoys the sunshine and warmth of the San Joaquin Valley district, tempered by the influence of San Francisco bay atmospheric conditions.

The original construction provided 306 beds. The insti-

tution was opened in April, 1925. The capacity as of March, 1938, is 312. Additional single rooms under construction will bring this capacity to 340.

With the exception of a few months in 1933, immediately following the passage of the so-called Economy Act, admissions have been limited to individuals suffering with pulmonary tuberculosis and its complications. General medical and surgical patients were received for a time in 1933.

The standard procedures for the treatment of tuberculosis are utilized at this institution including surgical collapse therapy of all types.



VETERANS' HOSPITAL SAN FERNANDO, CALIFORNIA

D C FARNSWORTH, M.D., Manager

THE Veterans Administration at San Fernando, built by the Government and officially opened February 22, 1926 is located in the foothills of the San Gabriel range of the Sierra Madre Mountains. It is a modern hospital maintained for the treatment of veterans of the army, navy, marine and army nursing corps. Towering mountains rise above, and the historical San Fernando Valley lies below. In addition to the original natural beauty of 616.6 acres comprising the hospital reservation, the hospital site is further beautified by tree-lined roads, shady walks, green lawns and beautiful flowers. The 40 buildings are Spanish architecture, in keeping with the nearby old Spanish Missions and early California traditions. Only the occasional hum of an airplane overhead, or a distant motor, indicate the close proximity of the busy metropolis of Los Angeles 26 miles away. Thus the atmosphere of peace and quiet is preserved, where the sick can obtain rest from a busy world and at the same time cure in a modern hospital—aptly expressed in a letter of appreciation by a former patient to the Manager "although I received all the modern treatment of medicine and surgery for my lung condition, I felt that I had been treated as a guest of a friend in his country estate." The climate has been ac-

claimed by phthisiologists and other health experts as ideal for the treatment of chronic illness such as tuberculosis. The Santa Monica hills on the south provide freedom from fog thus giving a large number of days of sunshine each year. Average summer temperature is between 55 and 87 degrees, winter average is between 45 and 70 degrees. The altitude at hospital proper is between 1650 and 1750 feet elevation.

This institution has every convenience and equipment necessary for modern therapy in the treatment of tuberculosis. It has been given a fully approved rating by the American College of Surgeons. Every department is manned by a group of highly-trained personnel and specialists. The hospital is designated as the Chest Surgery Center for this area, thus receives patients for collapse therapy not only from California but from surrounding areas, and is recognized as one of the leading government institutions in this modern field of tuberculosis therapy. The requests for treatment at this institution have become so numerous that present bed capacity is not adequate. A new modern infirmary building of 109 beds is now under construction and will be completed early in January. This new building will contain all of the facilities and conveniences for modern hospitalization.

California Sanatoria



OLIVE VIEW SANATORIUM

OLIVE VIEW, CALIFORNIA

OLIVE View Sanatorium was established by Los Angeles County in November 1920, in the foothills of the San Gabriel Mountains, 26 miles from the center of Los Angeles. The original capacity was 95 patients, which has been increased to 989, with adequate provision for the care and treatment of all types of tuberculosis. An additional 900 patients are cared for in Outside Sanatoria under the supervision of Olive View. It is the largest sanatorium in California and one of the largest institutions in the country.

Consulting specialists from the city supplement the work of the medical staff of 21 physicians.

Beautifully landscaped grounds and terraced hill-sides provide a background both pleasant and restful for the long period of taking the cure.

The affairs of the institution are administered by Arthur J. Will, Executive Superintendent and Edwin S. Bennett, M.D., Medical Director. The Post Office address is Olive View, California.



THE BARLOW SANATORIUM

LOS ANGELES, CALIFORNIA

THE Barlow Sanatorium was founded by the late Dr. W. Jarvis Barlow in 1901 when twenty-five acres in Chavez Ravine, Los Angeles were purchased. In 1902 the first buildings were erected.

The purpose of the Sanatorium was to care for residents of Los Angeles County suffering with pulmonary tuberculosis in the curable stages who could not afford to go to private sanatoria. At that time there were no institutions where people of small means could go and Dr. Barlow realized at that early date that curing tuberculosis required a longer period than most people could finance.

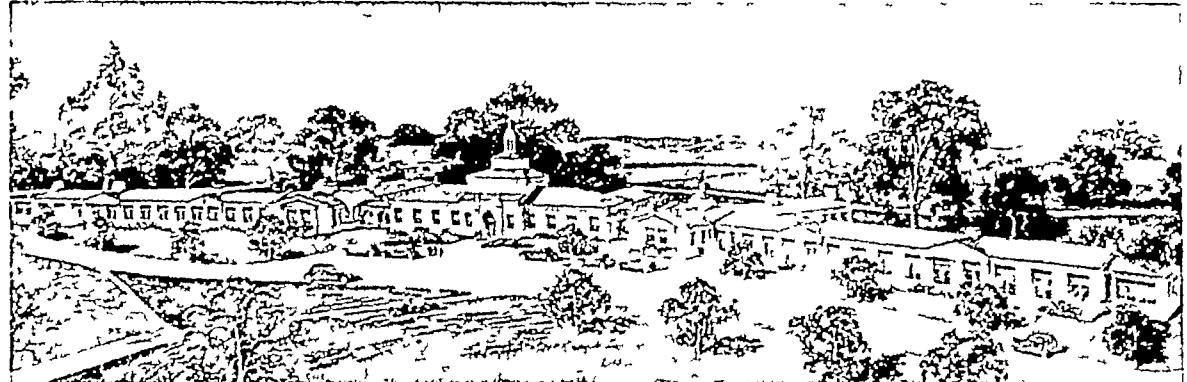
Opening the first two buildings in September 1903, with four patients, the institution has grown to one hundred beds which is the agreed limit of its capacity. It is non-sectarian. The charges have always been about one-half the actual cost the deficit being made up by

private subscriptions and interest on an endowment fund that was raised by Dr. Barlow.

In the early years the open air cottage system was used almost entirely there being only a comparatively few infirmary beds available, but as the treatment of tuberculosis has changed more and more hospital beds have been added until it has reached a point where over seventy-five per cent of the patients are bed cases. This is partly due to the fact that many of them have some form of surgery.

Over thirty-four hundred patients have been treated during the thirty-four years of the Sanatorium's existence and there is always a waiting list of applicants residents of Los Angeles County being given preference. Dr. Munford Smith was medical director of the sanatorium at the time of his death in 1937. Dr. Howard Bosworth succeeded him.

California Sanatoria



(Proposed Building, taken from Architect's drawing)

VAUCLAIN HOME

SAN DIEGO, CALIFORNIA

THE Vauclain Home was named after Mr J A P Vauclain who came to San Diego from Pennsylvania in 1887 for tuberculosis. He died in 1929 and he bequeathed one-third of his estate, amounting to \$36,605.36 towards the establishing of the present sanatorium. Dr A Morgan was the first physician in charge of the sanatorium and he was assisted by Dr Anderson.

The first sanatorium was comprised of tents and cottages and these were destroyed by fire in 1918. The following year, the County of San Diego built a new building to which were subsequently added, porches, a children's pavilion, a building for ambulatory male patients, and a women's infirmary.

Plans have been drawn for new buildings as shown above. When completed it will accommodate 116 patients and it will eventually house 300 patients at an approximated cost of \$600,000.

Dr S A Parowski is the present medical director and he has served in that capacity since 1928. The Vauclain Home has facilities for routine treatment as well as for surgical procedures. An out-patient department is maintained where about 80 patients receive collapse therapy. Chest clinics are held several days during each week.

The present buildings have far outlived their usefulness and the new buildings will give San Diego County proper facilities for the care and treatment of its tuberculous citizens.



ORANGE COUNTY TUBERCULOSIS PAVILION ORANGE, CALIFORNIA

H. E. ZAISER, M.D., Superintendent

THE above building was built in 1928 and the first patients were admitted to the wards in October of that year. It is a stucco building being built in a beautiful setting surrounded by Valencia orange trees. It has a capacity of 130 patients. The department is subsidized and is administered under the same administration as the general hospital which is located on the same grounds.

There is a full time resident physician in the depart-

ment one supervising nurse five graduate nurses fifteen attendants and one orderly. Dr E W Hayes, Monrovia, California, is in charge of the tuberculosis division and he visits the hospital one day each month at which time he also conducts a clinic in the out-patient department of the general hospital. Dr Waldo Wehrly of Santa Ana, California, is a member of the visiting staff.

California Sanatoria



ARROYO SANATORIUM LIVERMORE, CALIFORNIA

In the foothills of the Livermore mountains lies Arroyo Sanatorium, the tuberculosis sanatorium of Alameda County. It was established twenty years ago as the first county sanatorium built under the state subsidy law. The capacity is 190 beds. It operates in conjunction with the tuberculosis department of Fairmont Hospital (San Leandro) which is the admission department, thoracic surgical unit and chronic custodial care ward of the Alameda County Tuberculosis Service. Chest clinics are located in the principal cities and are also part of the tuberculosis service.

Adjacent to Arroyo Sanatorium is the Del Valle Farm, a childrens institution. Here there is a ward for children convalescing from various forms of illness and isolation

unit for children with active stages of childhood tuberculosis and bone and joint tuberculosis—and a building school and playgrounds for mal-nourished and underpar children. Many of these are children from tuberculous families. Del Valle Farm was established by the Alameda County and Health Association but is now operated by the County of Alameda in conjunction with Arroyo

The tuberculosis service of Alameda County is operated under the direction of the Alameda County Institutions Commission a board appointed by the county supervisors. Dr. Benjamin W. Black is the medical director of Alameda County and Dr. Chesley Bush is medical superintendent of Arroyo Del Valle and chief of the county tuberculosis service.



SANTA CLARA COUNTY SANATORIUM SAN JOSE, CALIFORNIA

CHARLES R. IANNE, M.D., Director of Tuberculosis

THE Tuberculosis Division was the first separate unit of the Santa Clara County Hospital and has come up thru crude beginnings to a modern 95 bed Sanatorium.

This Division was first housed in a brick structure which was demolished in the earthquake of 1906. This was replaced by 'The Tent' with wooden walls three feet high, screen sides and canvas top. Then came "The Tents" three of them for men and a larger one for women. One wing of the 'Pavilion' was built in 1910 consisting of a ward for men and one for women with a rustic living-room between. This room has come up thru many uses and is now a ward and hallway in the present sanatorium.

The Sanatorium was not a PLANNED unit but gradually evolved thru many changes and additions down thru the years. In 1927 a third wing was added but no provision was made for service and administration units, so considerable rearrangement was required to provide

for pneumothorax treatment room, laboratory fluoroscope room, nurses stations and doctors offices. In 1935 two wings were enlarged by the C.W.A. and the S.E.R.A. to take care of the increasing need for beds. The childrens ward was taken over for women patients which gave a bed capacity of 95 for adults. The children were transferred to one wing of Sunnyholme with a bed capacity of 28. This enabled us to take care of the long waiting list and release one of the wards for a much needed clinic room.

This year we hope to again enlarge the surgical space and improve the kitchen facilities.

The Santa Clara County Sanatorium has evolved thru many vicissitudes from a few beds for transient patients with scant supervision, to a modern sanatorium equipped to meet the increasing demands for all forms of collapse therapy which has brought our waiting list down to a minimum.

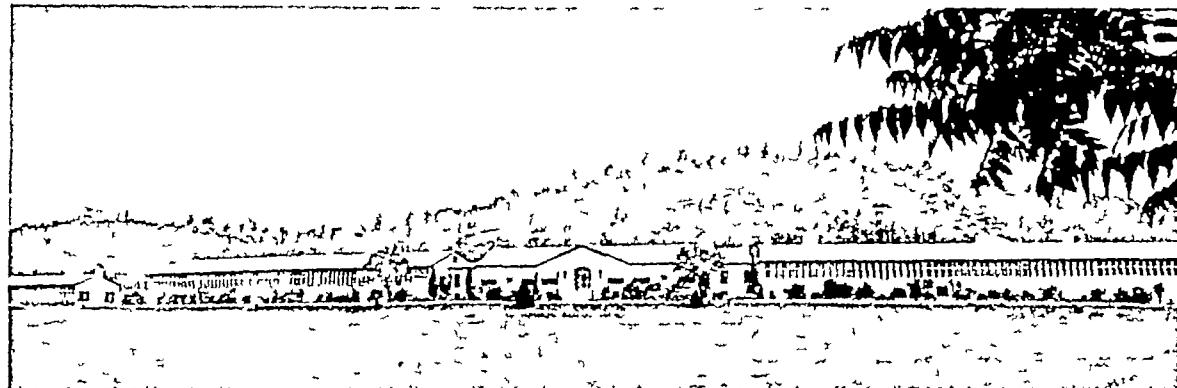
California Sanatoria



WISH - I - AH SANATORIUM AUBERRY, CALIFORNIA

NESTLED in the foothills of the Sierra Nevada Mountains, 42 miles from Fresno, is the Fresno County Tuberculosis Sanatorium, situated on a beautiful plateau of 160 acres. Under charge of Dr. Everett Morris, formerly tuberculosis expert in the Federal Government, the institution was officially opened for the reception of patients May 16, 1929, when 7 children entered the first being an orphan of an ex-service man. Now the institution has accommodations for 69 patients, 17 men, 20 women, 32 children.

The sanatorium is maintained for the care of curable cases of tuberculosis and for children suffering from glandular tuberculosis or undernourished children exposed to tuberculous infection. It is notable for the extensive use of electricity wherever possible and practicable in kitchen, laboratory, and elsewhere. The Wish-i-ah sanatorium has a follow up nurse who searches out contacts and advises them to visit the family physician or the Wish-i-ah lung clinic held by Dr. Morris at the General Hospital in Fresno.



BRET HARTE SANATORIUM MURPHYS, CALIFORNIA ELLIOTT PLUMMER SMART, M.D., Medical Director

BRET Harte Sanatorium is located in Murphys, a most scenic and historic town of the Mother Lodge region.

In March, 1928, the official opening took place and Bret Harte was dedicated to the care and rehabilitation of the tuberculous people of San Joaquin and Calaveras Counties.

The institution is comprised of a Men's and Women's wing, each with a 47 bed capacity, containing 10 rooms with 6 four-bed cubicles and a porch to accommodate

overflow population (which, at the present, is 20 beds over capacity).

The Preventorium, located adjacent to the Sanatorium, has a capacity of 65 children inclusive of a 12 bed Admitting or Isolation Unit, and combines a Boy's and Girls' ward, an auditorium with school-room facilities, and a dining room.

A recreational director sees that amusement is furnished, with a swimming pool the greatest enjoyment.

The decade Bret Harte has operated has seen 1900 patients admitted many of which have returned to health, happiness and useful occupations.

California Sanatoria



Tulare - Kings Counties Joint Tuberculosis Hospital

Wm. A. Winn, M.D., Medical Director and Superintendent

THIS sanatorium of one hundred and fifty-eight beds is located in the little village of Springville, approximately seventeen miles east of Porterville

Tulare and Kings Counties together took the first step in erecting a single-story frame building of thirty-six beds and a ten-bed ward unit for men in 1919 at an approximate cost of sixteen thousand dollars. Several years later a class A childrens' building with a schoolroom was constructed, providing accommodations for forty-two. Following this an infirmary with thirteen private rooms and a small surgery was erected and within a year an administrative unit added. Two years ago a new main kitchen and staff dining room with commissary and sleeping quarters for kitchen employees was erected and a new nurses' home built at the same time. During the summer of that year a modern outdoor swimming pool was constructed for the use of the Preventorium children. The money for this construction was donated to the hospital by many different people throughout both counties. Six months ago an eighty-five thousand dollar P. W. A.

project was completed which provided a very modern building for thirty-eight women and children suffering with tuberculosis and two separate ten-bed ward units for ambulatory patients one for men and the other for women. The new main building also contains a modern surgical suite and laboratory. At the present time the hospital has the latest equipment for the complete treatment of pulmonary tuberculosis in all its aspects. All forms of surgery are done up to and including thoracoplasties. Diagnostic procedures such as bronchoscopies, bacteriology, guinea pig inoculations and microscopic pathology are carried out.

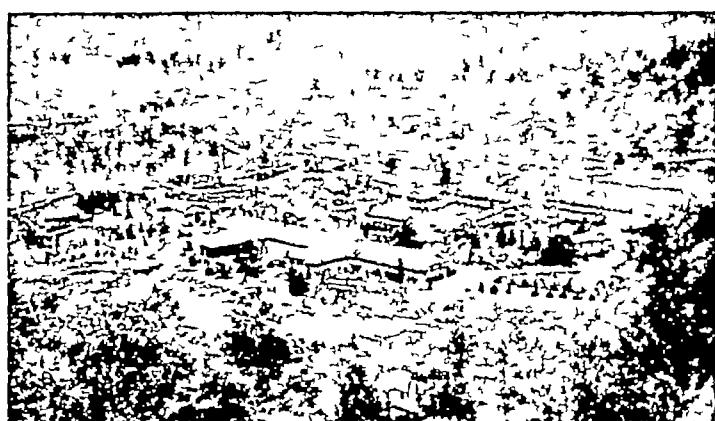
The hospital was first established with Dr. Tracy Melvin at its head. He retired three years ago and the present director replaced him.

The sanatorium maintains an active out-patient department for diagnosis and therapy.

The cost for maintenance and operation is pro-rated, Tulare County 73 per cent and Kings County 27 per cent. The beds are distributed between the two counties in the same proportion.

KERN COUNTY TUBERCULOSIS SANATORIUM

EMERSON C. SAVAGE, M.D.,
Medical Director



Stony Brook Retreat

STONY Brook Retreat is the Kern County Tuberculosis Sanatorium and was established in 1919. In 1927 thirty beds were added and the capacity is now 105 beds.

It is located in the Tehachapi mountains, 32 miles from Bakersfield.

Kern County Preventorium was established in 1929. Beds for children 44. The preventorium is operated in connection with Stony Brook Retreat.

Margaret Kissling is the director of Nurses and there are two resident physicians.

California Sanatoria



Terrace Annex for Tuberculous Patients (Rear Building)

ROSS GENERAL HOSPITAL

ENA M. BUNT, Manager

THE Terrace Annex for Tuberculous patients of the Ross General Hospital was built in 1919 with eight bed capacity as there were no accommodations in the community to take care of tuberculosis cases.

The demands for bed space increased and a nine room addition was built in 1930. A third addition of eight rooms was erected in July, 1936. We now have adequate accommodations for twenty-five patients.

ROSS, MARIN COUNTY, CALIFORNIA

The following equipment is available Fluoroscope, X-ray, deep therapy lamp, vital capacity machine, facilities for pneumothorax, pneumoperitoneum, thoracoplasties, plombage and phrenicectomies.

Dr Sidney J Shipman became interested in taking charge of this Annex or Sanatorium in 1924 at which time the general hospital was incorporated.



WEIMAR JOINT SANATORIUM

WEIMAR, CALIFORNIA

MILDRED THOREN, M.D., Medical Director

ACTING under power of California legislation which provided for the care of tuberculous patients, plans for the establishment of the Weimar Joint Sanatorium were begun in 1917 by a group of Supervisors from several Northern counties of the state, namely—Amador, Colusa, Contra Costa, El Dorado, Placer, Plumas, Sacramento, Sutter, Tuolumne, Yolo and Yuba.

The site chosen for the Institution is located in the low Sierras 48 miles east and north of Sacramento on the Lincoln Highway altitude 2400 feet, climatic conditions ideal.

The Sanatorium was completed and opened to patients in November, 1919, supported by the 11 counties men-

tioned and subsidized by the State. It is a charitable institution and is open to patients of all races and creeds who can satisfy the residence requirements.

Since that time it has expanded to care for about 525 patients at a time and during the past six years Solano and Sierra counties have joined the group.

The Federal Government has recently erected buildings to be used for Indians.

The Sanatorium is fully equipped to care for all stages of pulmonary tuberculosis, intestinal and bone tuberculosis when complicating pulmonary lesions. All methods of treatment are given.

California Sanatoria



Riverside County Tuberculosis Sanatorium

ARLINGTON, CALIFORNIA

JANET REID, M.D., Medical Director

FOR many years the Riverside County Hospital has had a separate building for active tuberculous cases and in 1929 a modern brick building was constructed with all necessary facilities, which at the present time accommodates an average of ninety-two tuberculous patients.

Regular diagnostic and check-up clinics are held

under the joint auspices of the Riverside County Health and Tuberculosis Association, the County Health Department and the Riverside County Hospital

Up to the present time all active tuberculous cases needing county care have been accommodated and we have no waiting list for admission.



San Luis Obispo County Tuberculosis Sanatorium

MELAINE KALFUS, R.N., Superintendent

In December of 1934 the San Luis Obispo County Tuberculosis Sanatorium was established in Los Berros Valley.

In 1937 Federal W P A. and county funds were appropriated by the County Board of Supervisors and the present Sanatorium was erected.

The Sanatorium, of early California Mission design, was built to care for forty patients, in wards and in private and semi-private rooms. The institution is equipped to do x-ray and fluoroscopic examinations, pneumothorax and minor surgery. For major surgery the patients have entree to the San Luis Obispo County General Hospital.

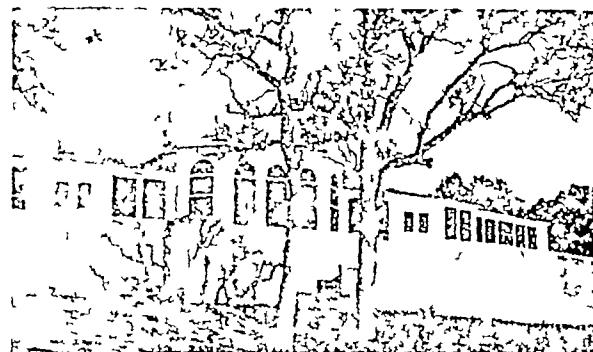
The nurses and nurses aids are especially trained in caring for the tuberculous.

A program has just been approved for landscaping the surrounding grounds with beautiful trees and shrubs.

Esther Rosencrantz, M.D., of San Francisco is the Medical Director and also has charge of the contact and out-patient clinic. William L. Rogers M.D. of San Francisco has recently been appointed chest surgeon. The follow-up clinic is conducted by the Superintendent.

The Sanatorium is owned and operated by San Luis Obispo County and is subsidized by the State of California.

California Sanatoria



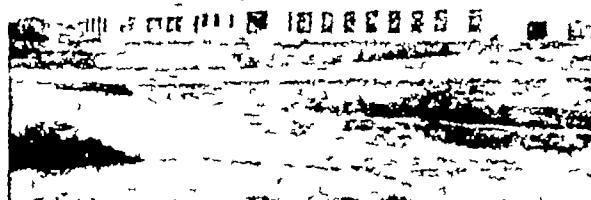
ONE WING OF SANATORIUM



BIRDSEYE VIEW OF HOSPITAL



TUBERCULOSIS PAVILION



AHWAHNEE SANATORIUM

AHWAHNEE, CALIFORNIA

AHWAHNEE Sanatorium, the sanatorium of Madera, Merced and Stanislaus Counties was opened September 29, 1920, for all stages of pulmonary and surgical tuberculosis. It is situated in the beautiful Sierra Nevada mountains, and it is reached by a rugged road from Madera. There are 118 beds including a childrens department. Dr Robert V Baker is the medical superintendent.

HUMBOLDT COUNTY SANATORIUM

EUREKA, CALIFORNIA

THE sanatorium was established in 1922 for all stages of pulmonary tuberculosis. Children are admitted in separate cabins. The sanatorium has a capacity of 65 and it is limited to residents of Humboldt County. Dr Allen R Watson is the medical director.

SAN BERNARDINO COUNTY TUBERCULOSIS SANATORIUM

SAN BERNARDINO, CALIFORNIA

THE sanatorium occupies a one story building of the pavilion type and is equipped to take care of 84 patients.

Dr E W Hayes of Monrovia has complete charge of both the hospital and clinic cases. Dr Norman Abbott of Ontario is the senior attending physician and Dr Ben D A Miano of San Bernardino is the junior attending physician. Dr V M Pinkley is the superintendent.

About sixty per cent of the patients are now receiving pneumothorax.

MONTEREY SANATORIUM

MONTEREY, CALIFORNIA

THE Monterey Sanatorium is a recent addition to the California county tuberculosis institutions. It was recently erected near the Monterey County Hospital in Salinas, California, and is equipped to care for patients with pulmonary tuberculosis in a modern manner. Dr John C Sharp, County Health Officer, is superintendent and medical director.

PACIFIC COAST STATES ISSUE

OREGON SECTION

OF THE

CHEST

EDITORIAL COMMITTEE

RALPH C MATSON, MD Portland, Chairman
 G C BELLINGER, M.D., Salem, and JAMES M ODELL, The Dalles

FOREWORD

THE Oregon Tuberculosis Association wishes to make grateful acknowledgement for this opportunity of presenting in this special Northwest issue of *Diseases of the Chest* the strides made in this section through the splendid co-operation of the members of the Committee of the Oregon Section

The principal objective of the Oregon Tuberculosis Association since its inception in 1915, has been to build up machinery to provide for the care and control of tuberculosis, fostering legislation to increase the bed capacity in the state institutions and to provide adequate public health nursing. Their intensive campaign has resulted in providing 40 beds at the Tuberculosis Pavilion in Troutdale, Oregon, 325 beds at Salem, Oregon

and 150 beds at The Dalles, Oregon. The latter institution is soon to open another unit of 50 beds. Selected surgical cases at these institutions are transferred to the Portland Open Air Sanatorium and the Multnomah Hospital, where pneumolyses and chest surgery is performed free of charge, the cost of hospitalization at the former institution being provided by the State Board of Control

Thus far, 30,000 tuberculin tests have been conducted among school children, teachers and adults coming to the clinic of the University of Oregon Medical School, which, as part of the Out-Patient Department, has a well organized tuberculosis clinic conducted under the supervision of Drs Matson and Bisaiion

Oregon Sanatoria



 MULTNOMAH COUNTY
 TUBERCULOSIS PAVILION

The Multnomah County Tuberculosis Pavilion was established in 1913 for the care of all stages of tuberculosis in any form through the efforts of the Oregon Tuberculosis Association

The pavilion was built to care for thirty-seven patients and admittance to the hospital is limited to the residents of Portland and Multnomah County

The hospital is located at Troutdale, Oregon

 VETERANS ADMINISTRATION
 HOSPITAL

The Veterans Administration Hospital at Portland, Oregon, is a general hospital with facilities for the care of thirty-two tuberculous patients in a separate ward

It is administered by the Veterans Administration Facility and admittance to the hospital is open to all veterans of any war, who are able to show an honorable discharge

Application for admittance should be made to the Regional Office, Veterans Administration

TUBERCULOSIS PIONEER WHOM WE COMMEMORATE



RAY W. MATSON, M.D.

1880 - 1934

DR RAY W MATSON was graduated from the University of Oregon Medical School in 1902, along with his brother, Dr Ralph C Matson, with whom his life was closely interwoven during the entire course of his medical career. From the very first he developed an absorbing interest in everything that pertained to medicine which was exemplified by a versatility that is very occasionally encountered in the realm of medicine.

After serving an active apprenticeship for three years as an interne in the Good Samaritan Hospital, he continued in his endeavors to learn more of the fundamentals of medicine by becoming engrossed in every phase of histopathology, and as an apprentice, who later becomes a finished artisan, he early mastered every technic in pathology from the performance of a complete autopsy to the cutting, staining and identification of the tissues himself, in the days before the advent of modern technical short-cuts. In fact, it might be said that the microtome and microscope somewhat symbolized his whole medical life and thought. Undoubtedly, this capacity to explore minute details and to thoroughly do little things well with his hands was an important factor in endowing him with the great ability he developed as a teacher in pathology and in medicine, and providing him with his broad viewpoint as a consultant, as a diagnostician and as a practitioner of his art. If the case presented obscure manifestations he obtained scrapings from tissue, preparing them himself, and demonstrated to the consternation of the entire Pacific Coast that it was leprosy. If a

lesion on the lip confused him, he did a biopsy and cured the cancer himself with an old Kinraide coil—the precursor of present day deep therapy machines. If a sputum or exudate needed classification, he made his own culture media and “planted” it all over the laboratory and would then inject any number of guinea pigs himself and then section the tissues, usurping the whole laboratory with staining dishes all about until he found the actual causative organism which was the trouble producer. His doggedness and determination in exploring the minutiae and details of any medical problem was one of his most outstanding medical traits.

Long before the present day concept, as recognized and acknowledged by internists and psychiatrists, of the role that is played by maladjustment in the production of fatigue, he delved into every phase of the patient's symptoms and reached the conclusion, which is still on hundreds of his case histories, that the patient was suffering from a “fatigue neurosis”—as is attested by the fact that large numbers of them are still suffering from the same complaints. Likewise, early in his career, in dealing with low grade fever, which persisted for months and years, he recorded on many of his case histories that patients were experiencing this slight elevation of temperature as a result of emotional maladjustments, which later years have proven to be correct.

In the early phases of pneumothorax work, indications and contra-indications for treatment were largely influenced by the status of the contralateral lung. During the time he was making a critical analysis of 600 pneumothorax cases, his attention was drawn to effects of pneumothorax on the evolution of the disease in the contralateral lung. With his characteristic thoroughness he examined the serial plates of each case and after making a classification of disease in the opposite lung, he published his conclusions in a paper “Observations in the Contralateral Lung in Pulmonary Tuberculosis,” which was a precursor to much of the medical thought which followed. His contributions on oleothorax, phrenicotomy and thoracoplasty procedures still remain classics.

He was essentially a pioneer in all of his medical thought and endeavors, as is well shown in his voluminous writings on diseases of the chest, on which subject he became an international authority and for which he was accorded many honors and recognition both at home and abroad. He had a wide acquaintanceship abroad as a result of many years of study with many of the great masters of medicine in Europe.

On the United States' entrance to the World War, Dr Matson was Chief of the Tuberculosis Examining Board, Vancouver Barracks, 1917—

Oregon Sanatoria

PORTLAND OPEN AIR SANATORIUM MILWAUKIE, OREGON



The "A. L. Mills Surgery"

An open air institution for treating pulmonary tuberculosis was one of the first attainments of the newly founded State Board of Health in 1903. Climate has been greatly over-played in recommending certain regions of the country as more suitable than others for tuberculosis patients. But few had considered the value of a climate such as that of Western Oregon which is neither inconsistently cold nor extremely hot and where despite alternate rains life in the open air is possible the year round without sacrifice of comfort.

Accordingly, philanthropic minded citizens of Portland contributed the initial funds for purchasing 14 acres of ground on Milwaukie Heights, overlooking the Willamette River. On this site seven miles from Portland was erected an administration building and a few tent houses, and patients were admitted for treatment on January 8, 1905. It was the first open air sanatorium for the tuberculous in the Northwest. In July 1905 the Portland Open Air Sanatorium was incorporated under the charitable laws of the State of Oregon. The results of these small beginnings were so encouraging that the conception of Oregon's climate being inordinately damp was quickly dispelled. Henceforth the board of managers labored persistently to further the exceptional cause.

Cottage "A" was donated by the Brooks family and "B" by the Corbett family. Mr. Whidden, a former member of the board, donated and planted the original shrubbery. The "nurses" cottage was built and equipped by the Oregon State Nurses Association with the understanding that members would be taken care of at the minimum sanatorium rate. The "Meier" cottage was a gift of the late Jeannette Meier, and the "Isam White Memorial" of Mrs. Isam White. The "D. C. Lewis" was built in memory of David C. Lewis by his sisters Mrs. A. L. Mills and Miss Sally Lewis. The "Kermiss" cottages 1, 2 and 3 were erected from the proceeds of a German Festival given in Portland for charitable purposes. "Kermiss" cottage 4 was a gift from Ben Selling.

Dr. E. A. Pierce was appointed Medical Director in 1905 which position he held until August, 1912. During

his service many new cottages were built, a modern sewage plant installed, a pavilion for open air amusement and exercise in stormy weather was constructed and quarters for fifty patients were erected.

Oregon was given a diploma signed by President Theodore Roosevelt for outstanding work done in the movement to control tuberculosis.

The Sanatorium is controlled by a Board of Directors. A. L. Mills of the First National Bank of Portland was the President of the Board until the time of his death. He was followed by the Honorable Henry L. Corbett and later on January 3, 1936 by Mr. Cameron Squires who holds that position at the present time. Dr. Ralph C. Matson and Dr. Ray W. Matson became the Medical Directors in 1912 and in 1916 Dr. Mart Bissell, their associate was added to the staff. Other members of the Board of Directors are composed of prominent Portland citizens.

The surgery of the Portland Open Air Sanatorium was built in 1926 by funds loaned by Mr. A. L. Mills of Portland, Oregon. This loan was repaid in full by charges received for the use of the surgery. It was named the "A. L. Mills Surgery" in honor of Mr. Mills.

The first phrenicotomies performed outside of Germany were done in 1914 at the Portland Open Air Sanatorium. Some of the earliest work in artificial pneumothorax in this country as well as the first work on oleothorax and pioneering work on intrapleural pneumolysis and other types of chest surgery began at the Portland Open Air Sanatorium.

The surgery was planned and furnished in keeping with the most modern methods for the sole purpose of chest surgery. In addition to the main surgery there is also a dark surgery fully equipped for performing pneumolyses and other intra-thoracic operations. The building is furnished with a complete x-ray unit as well as various types of apparatus for heliotherapy.

later, from September, 1917 to June, 1918, he served in the same capacity at Camp Lewis, Washington. On April 23, 1918, he was appointed Major, Medical Section, Reserve Corps, U. S. Army. From June 19 to September 1, 1918, he was Divisional Tuberculosis Specialist, 91st Division. From September 1 to December 12, 1918, he served as Divisional Medical Gas Officer, 91st Division. The battles in which he participated were St. Michel, France, Meuse-Argonne, France and Ypres-Lys, Belgium. During the tenure of his service as head of the Tuberculosis Examining Board at Camp Lewis he formulated a system for the examination of recruits which was later adopted by the United States War Department.

At the close of the war, he was honorably dis-

charged, Major, Medical Corps, U. S. Army, 1919. Later, he was appointed Lieutenant Colonel, Medical Reserve Corps, which title he held at the time of his death.

His influence is still felt by many hundreds of his medical students and many of his medical ideas still persist in the minds of his contemporaries who were his colleagues.

In his personal life, all those with whom he came in contact were impressed with the richness and warmth of his personality.

If one were to endeavor to characterize his whole medical life in an epitome of a few words, one could well say of Ray W. Matson— He was a good doctor."

—M. B.

Oregon Sanatoria

EASTERN OREGON STATE Tuberculosis Hospital

THE DALLES, OREGON

J M ODELL, M.D., Supt.

THE Eastern Oregon Tuberculosis Hospital, when buildings now under construction are completed, will consist of the main hospital building of three wings, hospital annex, pavilion, heating plant and laundry, nurses' home, superintendent's and resident physician's residences. These buildings are on a plateau five hundred feet above the City of The Dalles and overlooking it and the Columbia River.

Eastern Oregon was without a tuberculosis sanatorium until the present one was opened in 1929. At that time the main hospital building accommodating ninety patients and the superintendent's residence were completed. In 1932, a pavilion adequate to care for forty additional patients was completed. New buildings comprise a central heating plant and laundry, nurses' home which has quarters for thirty nurses, a physician's residence and a hospital annex of fifty beds. A preventorium for children when constructed will complete this unit. This additional building how-



ever depends on available funds. The value of the buildings is approximately \$370,000.

This institution is operated by the State of Oregon being under the direct supervision of the State Board of Control which is made up of the Governor, Secretary of State, and the State Treasurer.

Built primarily to care for patients from Eastern Oregon, many Western Oregon patients are admitted here due to an acute shortage of beds in that area, which comprises all the counties west of the Cascade Mountains and also has the major portion of the population.

The Dalles being west of the Cascade Mountains has a maximum of sunshine and clear weather which helps materially in raising the morale of patients.

OREGON STATE TUBERCULOSIS SANATORIUM

SALEM, OREGON

G C BELLINGER, MD
Superintendent

THE Sanatorium was established by an act of the Legislature in 1909 and was opened November 21, 1910. It has grown from a 60 bed open air sanatorium into a modern 325 bed institution equipped for the treatment of tuberculosis. It is located six miles southeast of Salem on a 149 acre site in the timbered foothills. The hospital is the central unit surrounded by four open air pavilions. There are three residences for physicians, a three story brick building for graduate nurses, a four story brick building for administrative purposes, and a



heating plant and laundry. The institution maintains a herd of sixty Guernsey cattle for its milk supply.

Pneumothorax treatments were first given in 1914. A large out-patient service is carried on. Ex-patients return for pneumothorax at definite periods. X-rays, laboratory routine, and physical examinations are done every six months. Tuberculin is furnished private physicians and Health Departments for skin testing and clinics for checking contacts are held frequently.

Total Removal of the Right Lung for Bronchogenic Carcinoma*

RALPH C MATSON, M.D., FACP, FACS,
JOSEPH M ROBERTS, M.D., AND MARR BISAUILLON, M.D., FACP
Portland Oregon

By successfully removing a carcinomatous left lung and thus saving the life of their patient, Evarts A Graham and J J Singer¹ in 1933 gave dramatic impetus to an operative procedure indicated by Nissen² of Berlin in 1931, and regarded by surgeons today as a probable means of recovery for many patients suffering from bronchogenic carcinoma.

The facts related to the frequency, pathogenesis and diagnosis of bronchogenic carcinoma bear a brief restatement. The disease has been variously reported as occurring in from 5 to 10 per cent of all cases of carcinomata³. Early diagnosis is possible in the great majority of cases because of the tendency to produce cough and blood-streaked sputum in middle-aged non-tuberculous individuals, who, on roentgenological examination, show an atelectatic process distal to the obstructed bronchus. In fully 70 to 80 per cent³ of this group, sections of the growth for histopathological examination can be taken through the bronchoscope and a clinical and roentgenological diagnosis will be confirmed. In the case to be presented, after negative findings by bronchoscopy, a much-neglected diagnostic procedure, namely, thoracoscopy, was resorted to, following the establishment of a diagnostic pneumothorax, and a positive diagnosis at that time was later confirmed by study of the removed lung.

Owing to the failure to obtain satisfactory results in the treatment of carcinoma of the lung by the use of radium and the x-ray, the resort to surgery was logical and the results have proved encouraging. Since the first successful pneumonectomy in 1933, for carcinoma of the lung, there have been numerous attempts, with a fair percentage of successes. Our search through the literature brings the total of such efforts to 47 (Kummell-one, Meyer-one, Archibald-two, Ivanissevich and Ferrari-one, Lilienthal-one⁴, Graham-four⁵, Rienhoff-twenty⁶, Freedlander-one⁷, Alex-

ander-one⁸, Overholt-ten⁹, Haight-one¹⁰, Flick-one¹¹, Lyle-one¹², Edwards-two¹⁰, Matson, Roberts and Bisaillon-one. Of these, upwards of twenty-eight are still living. The literature on this subject brought up to date in 1934 by Cameron Haight⁵ and later summarized by Archibald⁶, has been well covered by Graham³, Lyle⁷, Flick and Gibbons⁸, Rienhoff⁹, Walker⁴, and Overholt¹¹.

The particular objective of this paper is to call attention to the value of thoracoscopy as a diagnostic procedure where carcinoma of the lung is suspected and bronchoscopic findings are negative. No other method can yield so much authentic foregoing knowledge as direct visualization of the growth and its relationship to surrounding structures. Furthermore, because of the comparatively few total pneumonectomies performed for carcinoma, it would seem desirable to report not only the successful ones but also those which were unsuccessful, if the cause of failure is known, as in the case to be reported.

Report of Case

J S, aged 46 years, Servian, who had been employed in copper mines since 1917, was first seen in the Out-Patient Clinic of the Medical Department of the University of Oregon Medical School on October 15, 1935, complaining of a productive cough of two years' duration, and a dull precordial pain. Roentgenological examination revealed a consolidation of the upper lobe of the right lung, it was reported as "probably carcinomatous." The patient was advised to enter the Multnomah Hospital for further study but he refused. However, he returned for bronchoscopic examination on October 21, 1935, which was unsatisfactory because the instrument could not be brought into proper position to obtain a specimen for biopsy, only normal tissue being seen. On the 22nd of October, 1935, a diagnostic pneumothorax was induced and maintained until December 4, when the patient consented to a thoraco-

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scopic examination of the pleural cavity Nodules were seen through the visceral pleura which presented a typical gross appearance of a carcinoma Although specimens were taken for histopathological study, they were reported negative as the section was taken by an older type of forceps and was of insufficient size to permit thorough study, revealing only a chronic pleuritis of the visceral pleura It is very evident that the "bite" did not penetrate beyond the visceral pleura

The physical findings pertinent to this report were entirely within the thorax Prior to the establishment of the pneumothorax, there was dullness to percussion over the upper lobe of the right lung, with diminished breath tones The temperature averaged 100.6°F in the afternoon and the pulse ranged an average of 94 Respirations were 22 per minute

Following the thoracoscopic diagnosis of carcinoma of the lung, surgical removal of the lung was proposed The patient, however, refused operation and left the hospital December 11, 1935 He reentered February 19, 1936 because of aggravation of his symptoms The sputum, in the meantime, had increased to 200 cc in twenty-four hours, with occasional hemoptysis The roentgenological examination showed a marked extension of the growth with necrosis The diagnostic pneumothorax was reestablished Total removal of the right lung was again proposed and performed on March 5, 1936

Laboratory reports March 2, 1936 Hemoglobin 81.8 per cent—11.29 grams, RBC 3,390,000, Color Index 97, WBC 8,200, Polymorph Leucocytes 63 per cent, Polymorph Eosinophiles 5 per cent, Polymorph Basophiles 1 per cent, Small lymphocytes 21, Monocytes 6 per cent, Staff cells 4 per cent, Sedimentation rate 81 mm per 15 minutes, 104 mm per 45 minutes, Blood urea 14.2 Both blood Kilmer and Kahn tests were negative These had previously been positive The patient had had two years of anti-syphilitic treatment Kidney function tests were normal Urine was negative

Sputum

Amount varied from 45 cc to 210 cc Yellow—mucoid Repeatedly negative for tubercle bacilli Contained many short chained

streptococci Settled into three layers

Operation

70 mgm of Tri-bromethanol per kilogram of body weight were given as a basal anesthetic 30 minutes before the patient was taken to the surgery Because the electro-surgical technic was decided upon, nitrous oxide and oxygen were used to supplement the narcosis An incision was made in the 5th intercostal space through the intervening muscle layers and extended from the posterior axillary line to the sternal border on the right side, then parasternally to the 1st rib through the pectoralis major The 5th to the 2nd ribs inclusive were severed at their costochondral junctions together with the intercostal muscles This chest wall flap was then retracted upwards, giving an adequate exposure of the pleural cavity The middle lobe of the lung was found to be adherent to the pericardium and the upper lobe to the pleural cupola, subclavian vein and superior vena cava These adhesions were severed with the high-frequency current (Bovie Unit) Posteriorly, there were extensive adhesions in the costovertebral gutter, and, inferiorly, dense adhesions were present between the base of the lung and the diaphragm—all of which were severed with the electrode In spite of profuse bleeding it was controlled by electrocoagulation The pulmonary ligament was then severed from the diaphragm to a point just below the inferior pulmonary vein, and the phrenic nerve isolated and cut anterior to the hilus Because of massive infiltration of the lung close to the hilus only one snare could be placed in position The lung was then severed about 2.5 cm from the bifurcation of the trachea While the hilus was severed as close as possible to the snare, carcinomatous tissue still remained in the hilus stump This was cut out with a loop electrode, leaving a crater-like stump, and because of fear that the snare might slip off, it was found possible to place a No 3 chromic gut ligature still closer to the mediastinum to prevent hemorrhage in case the snare lost its grip The pulmonary artery and veins were then isolated and tied with No 12 braided silk Because of the short bronchus stump preventing a better form of closure, it was cauterized with phenol which was neutralized

with alcohol. The walls were then brought together with interrupted waxed black silk sutures. The entire stump was closed with interrupted chromic gut sutures. The snare was then slowly released. No bleeding took place. Because of the necrotic type of lesion and the fact that there was so much invasion of the hilus that the stump could not be well covered with tissue and a bronchus leak was anticipated, a Pezzar catheter was placed in the mid-axillary line two intercostal spaces above the level of the diaphragm to allow for its probable elevation. The ribs were approximated with chromic catgut and the intercostals, as well as other muscle layers, brought together with catgut, the skin being closed with dermal.

Although the patient stood the operative procedure well, 450 cc of citrated blood were given intravenously during closure of the chest wall. He was returned to his room in good condition but was immediately placed in an oxygen tent. His blood pressure remained between 90 and 110 systolic, and 60 and 70 diastolic, with a pulse ranging between 70 and 120 during the first postoperative week. Intravenous glucose was administered daily. On the third postoperative day an x-ray film revealed no evidence of fluid in the pleural cavity. On the seventh day, however, roentgenological examination revealed fluid in the right pleural cavity, with improper drainage. The Pezzar catheter which had been placed for drainage at the time of operation, was obstructed by the rising diaphragm. Because of elevation of temperature and evidence of empyema, drainage tubes were placed, on this date, in the 2nd interspace in the anterior axillary line and in the 6th interspace, in the mid-axillary line, for through-and-through irrigation with Azochloramid. At this time 1500 cc of seropurulent fluid were removed from the pleural cavity. Daily aspirations totalled from 150 to 500 cc. Complete drainage was obtained on the ninth postoperative day and the patient's subsequent course was uneventful. The patient's general condition was so good that special nurses were dismissed and because of urgent need of hospital beds the patient, who had occupied a two-bed ward alone, was moved into a six-bed medical ward, where shortly afterwards a number of pneumonias developed. Our patient contracted an acute

respiratory infection accompanied by severe coughing, which was no doubt responsible for the development of the small bronchial fistula which was recognized on the 17th day, but caused no great embarrassment to the patient. He expired suddenly on the twenty-sixth postoperative day, at the time when considered well on the way to recovery.

Pathological report Well differentiated squamous cell bronchogenic carcinoma of the so-called hilar nodular type.

Autopsy report Death was due to an acute massive hemorrhage from an erosion of the superior pulmonary vein just below the bronchopleural fistula, the small opening in the right main bronchus being just above the erosion on the superior pulmonary vein. There were no metastases.

Comment A case of bronchogenic carcinoma of the right lung is reported which presented certain interesting features. Cancer of the lung, if early diagnosed and surgically treated, carries a more hopeful prognosis than if therapy is delayed, as in this case, due to the patient's refusal of operation in December, 1935. At that time the growth was comparatively small and the lung, as viewed through the thoracoscope, was adherent to the chest wall by rather insignificant band adhesions. In spite of negative bronchoscopic findings the thoracoscopic examination revealed a typical carcinoma, which was confirmed later at operation. At the time of the thoracoscopic examination, total pneumonectomy would have been relatively simple and there would have been little time wasted in mobilizing the lung. Furthermore, there would have been ample uninhabited tissue in the hilus to sever the bronchus transversally and affect a better closure than was possible because of its having been cut vertically, which involved greater difficulty of secure closure. Moreover, at the time the patient returned for operation, because of marked increase in constitutional disturbance, the primary pneumothorax had been partially obliterated and dense adhesions had formed between the parietal and visceral layers of the pleura—thus prolonging the operation. The distribution of the tumor made it necessary to sever the bronchus close to the bifurcation of the trachea. We were unable to bury the stump because of the massive character of the neoplasm.

which provided insufficient mediastinal pleura. Nevertheless, the exact position and nature of the tumor and its adhesions were determined by direct vision through the thoracoscope preoperatively, at which time total right pneumonectomy would have offered a more definite outlook for recovery. In spite of the technical difficulties encountered in this case and successfully overcome, it is felt that the violent coughing during the acute respiratory infection opened the bronchus, which caused the erosion on the superior pulmonary vein, resulting in fatal hemorrhage twenty-six days after operation.

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Secondary Intestinal Tuberculosis

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THIS paper is devoted entirely to secondary and usually ulcerative intestinal tuberculosis as a complication of pulmonary tuberculosis. It has been denied by some that primary tuberculosis of the intestine occurs. However, it seems safe to say that some 15 per cent of frank clinical cases of intestinal tuberculosis are primary, but that these primary cases present themselves with a much different onset and clinical picture, so that they may be missing entirely in a fairly large group which reports to chest clinics or institutions for the care and treatment of tuberculosis.

Intestinal tuberculosis has long been recognized as a most important complication of pulmonary tuberculosis. Autopsy figures from many sources have shown that tuberculous involvement of the intestines occurs in 75 per cent or more of pulmonary cases by the time death occurs. In clinical cases its occurrence varies with several factors which may be present. This will be discussed later on in this paper. Suffice it to say here that, roughly speaking, it is apt to be present in from 15 to 20 per cent of the cases of frank pulmonary tuberculosis as they present themselves to the physician. Its importance in the clinical management of pulmonary tuberculosis is, therefore, very great and the

condition should be constantly kept in mind.

Following earlier observations made by Stierlin especially, Brown and Sampson published their work in 1919 which brought the management of this condition into an orderly plan of diagnosis and treatment. In 1926 the first edition of their monograph on Intestinal Tuberculosis was published. This outlined the history, pathology, symptomatology, diagnosis and treatment, and contained 590 references on the subject. In 1930, the second edition of similar scope with 783 references was published.

During the last twelve years, not less than 72 per cent of the frank cases of pulmonary tuberculosis admitted to the Oregon State Tuberculosis Hospital have been studied by the diagnostic methods recommended by Brown and Sampson. The following is the procedure used. Fluoroscopic examinations are made and films taken at four periods during the passage of the barium meal through the intestinal tract. The meal substantially as recommended by Brown and Sampson has been followed. This consists of 4 ounces of barium sulphate mixed with a little water, then milk added to make 14 ozs. A little malt may be used for flavoring. This mixture is rather pleasant in flavor, but the bulk as well as the more or less powdery

taste is not especially relished. However, no serious difficulty arises in giving it. Laxatives are avoided the previous 15 hours, and the meal is given on an empty stomach at 7:00 a.m. so that the observations will fall at 2:00, 3:00, and 4:00 o'clock in the afternoon and the 24 or 25 hour observation will fall at a convenient time the next morning. Various modifications of the technique have been tried from time to time. In frankly negative cases, some modification might be sufficient and allow saving of time and expense. However, the best we were able to do seemed so much worthwhile and a uniform series of records helped us so much in checking back in certain cases, that we have held to the technique of examination above referred to with the feeling that we are obtaining values from it which we have not been able to work out otherwise. Barium enemas have been tried from time to time. We have found them of value, but only as a supplementary procedure.

We fully recognize that the findings of the barium meal are not specific in tuberculous entero colitis. On the other hand, in a service of this kind, where frank pulmonary tuberculosis is kept under regular resident observation and frequently checked by a rather intensive clinical program, the procedure will diagnose the condition with a high degree of accuracy.

For statistical study in this paper, the years 1924 to 1936 inclusive have been used. The percentage of pulmonary cases diagnosed by this method as having a positive intestinal involvement has ranged from 31 to 12 of those studied, it being lower in the more recent years. It is of interest to note that during this 12 year period the per cent of pulmonary cases discharged as improved, quiescent, arrested has increased from 43 per cent in 1912 to 69 per cent in 1936 with an institutional death rate dropping correspondingly from 36 per cent in 1912 to 19 per cent in 1936. Credit for part of this we feel goes to the early diagnosing and treating of the cases who develop the intestinal complication.

As is to be expected, the highest per cent of positive intestinal cases occurs in the cases with the far advanced type of pulmonary disease. Our records show that 75 per cent of the positive intestinal cases were far ad-

vanced, 20.6 per cent were moderately advanced, and 4.4 per cent were minimal cases.

Another point of interest to note is the ratio of the positive readings to the number of cases with pulmonary cavities present. Eighty-two per cent of the intestinal positives had such cavities, a little over 10 per cent did not have cavities. In reading cavities, we have been inclined to read cavitation present when rarefied areas were present in a fairly dense infiltration, even though such rarefactions were not sharply defined as cavities. We have been led to this position by the frequency with which clearly defined cavities can be seen in such infiltrations after pneumothorax has been started.

As to the sputum findings in the cases studied, over 95 per cent had a positive sputum. In testing sputum, we not only use the concentration method of antiformin in all cases negative by the routine methods, but we also collect seven day specimens in 5 per cent phenol when tubercle bacilli are not found by the cold stain slide method.

The following table is an analysis of symptoms referable to the abdomen in 172 consecutive and unselected cases which were read positive and doubtful in our barium meal studies. The doubtful readings might have been left out of this table as they do not constitute over 10 per cent of the total and would not, therefore, seriously effect the general picture which this table gives. Under this heading, too, I wish to report that our work confirms the value of being especially on guard as to intestinal tuberculosis in cases which do not do well even though their chest condition suggests that they should. In discussing symptoms, I wish to call your attention to the fact that our study supports the point that a very substantial number of cases of intestinal tuberculosis do not complain of symptoms which are liable to attract the attention of the physician at the time that the diagnosis can be made by barium meal. This fact has been called to the attention of the profession so often that I think we can no longer question that the barium meal allows the roentgen ray to point out tuberculosis of clinical importance in the intestinal tract long before it would express itself by symptoms, just as the same agent may do in the chest.

Symptoms in 172 Positive and Doubtful Cases Unselected

	No Cases	Per Cent
Loss of Appetite	37	21.4
Soreness	11	6.4
Cramps	8	4.6
Indigestion	40	23
Discomfort	7	4
Diarrhea	11	6.4
Constipation	30	29
No symptoms	75	43.6

12 per cent had constipation as the only symptom (Digestive)

7 per cent had loss of appetite as the only symptom (Digestive)

The physician in general practice who finds the rather complicated and time consuming barium meal procedure impractical, may resort to the barium meal enema using 8 ounces of barium sulphate mixed in 1½ quarts of warm water Our impression is, however, that a negative enema reading might be misleading, though a distinctly positive reading is quite helpful Until such time as the barium diagnostic procedure can be carried out, the physician should be on his guard against this complication which occurs in such a substantial number of his cases of pulmonary tuberculosis He should become suspicious and treat expectantly any case that does not do as well as he feels it should from his observations of the chest conditions He should be especially suspicious when sputum positive disease has been present for some time If regular sputum examinations are not available, he may consider that sputum would be more or less continuously positive when frank cavity or well established disease is accompanied by chronic cough and expectoration of muco purulent sputum

Treatment

I think we should keep in mind the good general management of our tuberculosis cases, the special hygiene that will have them dispose of their sputum with the least possible contamination of their throat, mouth, and the intestinal tract, as well as other tracts adjacent to the throat and mouth region, and the advantage of closing lung cavities and rendering sputum negative as early in the course of disease as possible We have used ultra violet energy and special

diet since 1923 when we first instituted the program of control of intestinal tuberculosis as recommended by Brown and Sampson

Ultra-Violet

The Ultra-Violet is supplied by mercury quartz burners supplemented by natural sun in the morning or evening hours of the summer time in suitable cases The plan of gradually increasing the time and area in Ultra-Violet exposure has been followed from the start Treatments are given daily except in tapering off what seems to be a successful course We have worked under the principle of thoroughly exposing the skin area to mild exposures, or more intensive exposures, if well borne In the earlier years, carbon arc lamps of various types were used to some extent and apparently good results were secured However, mechanical objections of various kinds caused us to discard carbon arc lamps so that mercury quartz burners have been used almost exclusively during the past seven years in the mechanical generation of Ultra-Violet energy

I believe Ultra-Violet has been the most fundamentally valuable form of treatment in our work with intestinal tuberculosis We have made it a practice to protect the eyes and head region The chest has been protected to varying degrees according to the judgment of the various physicians It is my personal belief that no one has proved Ultra-Violet to be especially injurious in the sense of causing new spread of disease or destructive changes in tuberculous lesions and that, if we keep in mind the principle of mild exposures which can be given with comfort to the patient, the chest area can be exposed much more than it has been in the past

We have not used cold quartz generators but note that they have been accepted by some as an efficient source of ultra-violet energy Any source of ultra-violet which gives the quality and quantity required is satisfactory The reaction of the skin and the comfort of the individual patient should be used as a guide Skin irritation should be avoided as much as possible Those with very sensitive skins may be hardened in by air baths and the air baths may be supplemented by the weaker ultra-violet lamps often recommended as "health lamps," but these should not be depended upon for definite

treatment On the other hand, intensive ultra-violet exposures crowded into the shortest possible space of time are neither necessary nor desirable Rapid tanning should not be sought Moderate doses will allow a gradual tanning without irritation or discomfort in those who respond especially well, and such doses should be our standard

We have not tried Roentgen ray in treatment, though I feel we might have done better in some of our refractory cases had we done so

Diet

The special diet used by us in intestinal tuberculosis has undergone considerable modification during the past 12 years Brown and Sampson in the first edition of their book published in 1926, devoted one-half page to diet The second edition issued four years later gave 5 1/4 pages to this phase of the subject At first, we had in mind only a bland diet to avoid irritation of the diseased intestines This diet was neither satisfactory to the patient nor sufficiently protective in vitamins, and perhaps did not contain sufficient protective minerals in cases which did not take pureed vegetables or milk well

Very early we began allowing the use of some of the less fibrous vegetables and some of the fruit juices which were at first excluded From the start we have excluded irritating spices, condiments, and foods containing hard and sharp particles such as corn and oat husks, bits of apple core, etc , etc We feel that this should be routinely enforced Our break over to a more generous diet has been rather rapid during the past five years Tomato juice and rich Cod Liver Oil were added as a diet supplement soon after McConkey's work was reported

The particular importance of vitamins "C" and "D" in intestinal tuberculosis was first brought out by the work of A H Grant published in 1926 This was further emphasized by the work of McConkey and Smith and especially by McConkey's report of treatment

of intestinal tuberculosis with rich Cod Liver Oil and tomato juice which was published in 1929 In our own work we have found a plan based on the work of Grant, McConkey, et al essentially sound and we believe that the physician in general practice should see that the diet of his cases of tuberculosis and particularly those with possible intestinal involvement, includes an adequate supply of vitamins More specifically he should see that the supply of vitamins "C" and "D" are adequate Tuberculosis apparently absorbs vitamin "C" in direct proportion to clinical activity At least the patient should have an adequate supply and this should be prescribed in the form of cevitamic acid tablets, if necessary

Calcium intravenously was started in our service immediately after the publication of the work done at the Fitzsimmons Hospital in Denver, and calcium has been continued quite routinely in some form since that time Most of the intravenous calcium is now given as 5 per cent chloride with 10 per cent dextrose in physiological saline solution and is our method of choice for abdominal discomfort and pain Doses are spaced from once in seven days for routine to once daily in more extreme cases of painful ulceration Under this plan of management diarrhea has not been a serious problem We do have a few cases of protracted diarrhea which are entirely refractory to treatment Some of these are apparently accompanied by amyloid disease This point has not been scientifically checked in our service Symptomatic medication, as usually recommended, has been used as necessary Small doses of castor oil have been found useful in relieving intestinal soreness Iodoform internally has been used occasionally in some cases

The records of our present patients who have intestinal tuberculosis contrast sharply on the favorable side when compared with those with this complication before this form of management was put into use

An invitation is extended to all physicians to attend
 The Scientific Session of
 The American College of Chest Physicians

California Biographies Continued

FRANCIS MARION POTTER, M.D

(Continued from page 24)

published by C V Mosby Co, St Louis "Muscle Spasm and Degeneration in Intrathoracic Inflammation and Light Touch Palpation," 1913, "Tuberculin in Diagnosis and Treatment," 1913, "Clinical Tuberculosis" (2 vols), 1917, 2nd edition, 1922, "Symptoms of Visceral Disease," 1919, 2nd edition 1922, 3rd edition 1925, 4th edition 1930, 5th edition 1938, "Tuberculosis and How to Combat It," 1921, 2nd edition 1928, "Tuberculosis in the Child and the Adult," 1934

—E B

ROBERT A PEERS, M.D

(Continued from page 9)

parts of the west to carry on the work begun by Peers himself The affectionate regard in which these men hold him is perhaps one of Dr Peers' most cherished possessions

Among the honors confirmed on Dr Peers in the past may be mentioned President, Placer County Medical Society, Secretary, Placer County Medical Society (Incumbent), President, California Northern District Medical Society, President, Placer County Tuberculosis Association, President, California Tuberculosis Association, Director, National Tuberculosis Association, President, California Academy of Medicine, President, California Medical Association

Dr Peers is at present a member of the Placer County Medical Society, California Medical Association, Fellow in the American Medical Association, Fellow in the American College of Physicians, California Academy of Medicine, member American Board of Internal Medicine, Fellow in the American College of Chest Physicians

—S J S

WALTER JARVIS BARLOW, M.D

(Continued from page 11)

vent his active participation in a large number of movements for the civic betterment of his community He was presented with two honorary degrees from his Alma Mater, Columbia University, Master of Arts in 1919 and Doctor of Science in 1929

This short account of Dr Barlow's activities and honors gives some idea of his professional attainments With all his contacts with his fellow man, he exhibited a rare charm and magnetism which accompanied an unusual kindness and interest in other people

—E R W

MAX ROTHSCHILD, M.D

(Continued from page 11)

beneficial effects were obtained

He often detailed the discouraging criticism he brought down upon himself when—in 1909—he

fore the County Medical Society, he detailed the possibility of administering medicinal agents intravenously A medical patriarch present demanded the floor to "sound a note of warning" and advised against any such dangerous procedure

In 1914 he directed many experiments in the use of aniline dyes in the treatment of tuberculosis, as well as their use by direct injection into lung cavities through the chest wall

His many contributions to medical literature included monographs relative to the early diagnosis of adult and childhood tuberculosis Being a collaborator with Hanz Much and Deyke of Germany, he gained international recognition At the time of his death he was preparing a paper to be delivered at an Eastern conference in September, which detailed his experiences with tuberculin over a period of thirty years

His knowledge of music and the arts, combined with an incomparable personality, made him an outstanding figure in any assemblage Over and above this, however, he will ever live in the hearts of all his friends for his generosity and innate kindness He was an eternal optimist and had the God-given ability of making every sick individual feel cheerful and buoyant after his bedside visit Nor was this optimism assumed as a cloak for a bedside mannerism—his optimism permeated his whole personality

A gracious host, he was known over the entire coast for his delightful hospitality, which made him beloved among his friends and colleagues As "Max" he was known not only for his unusual professional ability, but also for his charitable services for the less fortunate persons who comprised a great percentage of his practice

A patient contributes

*He is not dead, and this is not the end—
He leaves a living monument behind,
And deep within our hearts the years will find
The ever-smiling presence of a friend*

—H W

WILLIAM H BUCHER, M.D

(Continued from page 12)

entitled "Surgeon Errand" in 1935 His services were recognized by his election as president of the Trudeau Society of Los Angeles in 1932, as vice president of the California Tuberculosis Association in 1934, and as president of the California Sanatorium Association in 1933

With his death on December 30, 1934, the anti-tuberculosis movement lost one of its most effective and far seeing executives, and thousands of patients lost a devoted friend The Olive View Sanatorium in Los Angeles County, with its beautiful scenic setting, its thousand patient beds, its modern surgical pavilion, its extensive clinical and research laboratories, and its graduated system of care and rehabilitation, remains as a monument to his efforts

—E B

PACIFIC COAST STATES ISSUE

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WASHINGTON SECTION

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Tuberculosis Pioneer

JOHN WEINZIRL, M.D.
1870 - 1935

JOHN WEINZIRL, professor of bacteriology and director of the McDermott Foundation at the University of Washington at the time of his death, June 26, 1935, was a native of Wisconsin. He was educated at River Falls Normal School and the University of Wisconsin (B.S. 1896, M.S. 1899, Ph.D. 1906). Deeply interested in public health, he won the degree of Dr. P.H. (1918), at Harvard while on sabbatical leave.

In the fall of 1896, while engaged in special studies at the University of Wisconsin in preparation for accepting an appointment as director of research at Agricultural Experiment Station, Geneva, New York, he was stricken with tuberculosis. This event changed the course of his life and gave direction to a substantial part of his future research work.

He went immediately to New Mexico, where he remained for nine years and completely regained his health. During this period he served as assistant professor of biology at the University of New Mexico (1897) and professor of biology and

FOREWORD

THE Washington Tuberculosis Association takes this opportunity to congratulate the Editorial Committee of the Washington Section of this issue of *Diseases of the Chest* for a splendid portrayal of the sanatorium facilities for the treatment of tuberculosis in the State of Washington.

Since its organization in 1906, the Washington Tuberculosis Association has promoted a continuous campaign of education against tuberculosis, as well as secured legislation authorizing county commissioners, separately or by forming districts to construct and maintain sanatoria and to employ public health nurses. There are now seven county and one municipal sanatoria with a total capacity of more than 900 beds.

Faced with the need for nurses trained for public service, the Association in 1918 sponsored a summer course in public health nursing at the University of Washington so successfully that in the fall the University made it an integral part of its curriculum.

Recognizing the vital importance of early diagnosis, in 1920 the Association developed an itinerant diagnostic chest clinic and consultant service with a full-time specialist in charge. Mantoux tests have been stressed especially in the high school and college age since 1931, over 13,000 tests being given in 1937. The splendid cooperation of physicians, public health officials, educators, and tuberculosis leagues has been an important factor in attaining this result.

During the life of the Association, the death rate from tuberculosis has decreased from 104 per 100,000 population to 46 per 100,000 in 1937, despite a rapidly increasing population.

chemistry (1900), and as director of the Hadley Climatological Laboratory.

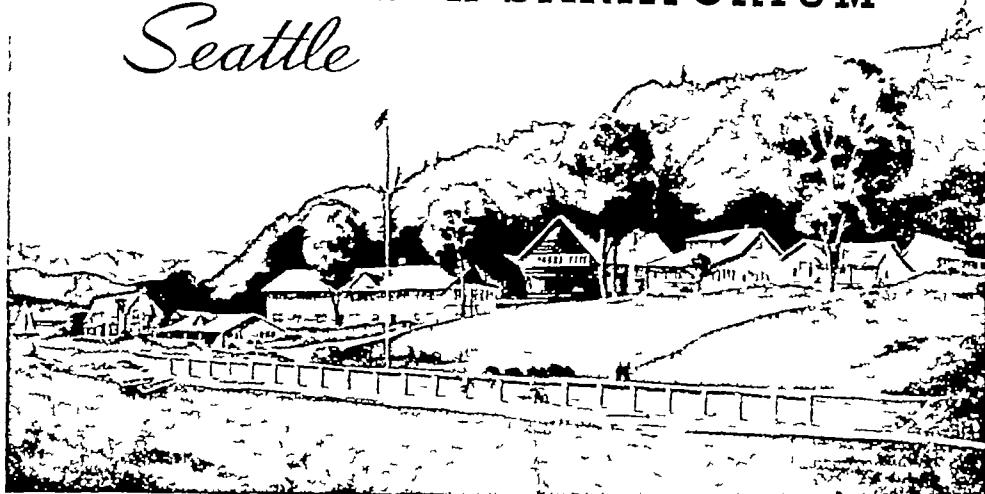
He was called to the University of Washington in 1907. The McDermott Foundation for tuberculosis research was created in 1924 and Professor Weinzirl was made director.

Professor Weinzirl's published scientific work comprised some forty-five titles, distributed about equally among three fields (1) the pure science of bacteriology, (2) the applied field of sanitary bacteriology and public health, and (3) tuberculosis. Perhaps of chief interest in this latter field was his work on the desensitization of tuberculous guinea pigs to the toxic products of tubercle bacilli.

—A W

Washington Sanatoria

LAUREL BEACH SANATORIUM Seattle



FREDERICK SLYFIELD, M.D., and JOHN E NELSON, M.D., Medical Directors

THE Laurel Beach Sanatorium a private 75 bed institution for diseases of the chest is ideally located with a magnificent view of Puget Sound and the Olympic Mountains. The sanatorium was established in 1921 by the present medical directors who are the proprietors of the institution. It is completely equipped with laboratory, x-ray, surgery, etc. for

diagnosis and for medical and surgical treatment

All of the rooms are either private or semi-private which affords the patient the greatest amount of comfort conducive to well-being. There are no wards. The rates including medical service and pneumothorax are \$25.00, \$30.00, and \$35.00 per week.

RAYMOND TENNANT, M.D., Surgeon

KATHERINE STEWART, Med Technologist

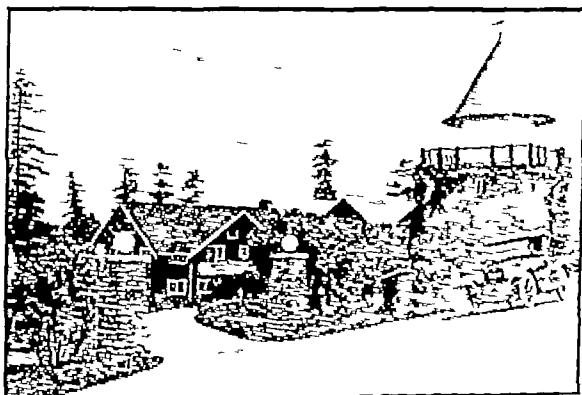
MURDINA McDONALD, R.N., Superintendent

EDNA FERBERT, Dietician

RIVERTON SANATORIUM SEATTLE, WASHINGTON

MRS LOUISE W HARRIS, R.N.,

Superintendent



THE sanatorium was established in 1908 by private endowment, the Riverton Sanatorium is operated on a non-profit basis. The founding of the institution was made possible by the generous donations of Miss Sarah W and Miss Margaret L Denny members of a well-known pioneer family in Seattle. Since then additions to the endowment and maintenance funds have been made by many other individuals. The institution has been fortunate since the beginning in having on its Board of Trustees outstanding citizens who have given very generously of their time and wise counsel.

The Sanatorium is situated on forty-five acres of beautiful grounds on the wooded slope of Riverton

Heights three miles south of Seattle. At the present time it has facilities for the care of fifty patients in an infirmary and cottages. The Board of Trustees plan to erect a modern forty-bed infirmary within the near future.

The endowment makes it possible to give modern treatment and comfortable accommodations to the patients at very moderate rates. The sanatorium is operated on the 'open plan' so that physicians may personally manage their own private patients. It has adequate x-ray and pneumothorax facilities. The present medical director is Dr. Byron F. Francis. There is also a resident physician.

Washington Sanatoria



Walter Henry Memorial or (Administration Bldg)

FIRLAND SANATORIUM

6 miles North of Seattle

RICHMOND HIGHLANDS, WASHINGTON

DURING 1910, Horace C Henry a charitable citizen of the City of Seattle, donated a tract of 34 acres to the City of Seattle for a Tuberculosis Sanatorium. This is the present site of Firland Sanatorium. Mr Henry besides donating the land gave generously of his money and time so that Seattle could have a place to cope with Tuberculosis, which was making great inroads on its citizens.

Work proceeded on the erection of several cottages and the Sanatorium opened its doors on May 2nd, 1911

with 2 patients, a Superintendent and 1 Registered Nurse

It has grown to a 250 bed capacity and embraces several large structures like the above

The Medical Director is Dr Robert M Stith and Mrs Edna L Robinson is the Superintendent

The plant is owned and operated by the City of Seattle, and accepts patients with one year, or more city residence

It maintains a high standard, consequently it ranks high in the number of arrested cases secured

KING COUNTY TUBERCULOSIS HOSPITAL

W W SCHWABLAND, M.D.,
Superintendent

PHILIP H. NARODICK, M.D.,
Medical Director



KING County Tuberculosis Hospital was first established as a part of the King County Hospital System in 1901, being a tent hospital accommodating only the terminal cases.

Numerous additions have been built so that, at the present time, there are six units housing 165 beds. There is a separate section for administrative offices, x-ray and laboratory departments and a complete

surgery Pneumothorax thoracoplasty, phrenic nerve operation and intrapleural pneumolysis are done regularly

An outpatient department is included as a part of the hospital service for case finding, diagnosing treatment, and rehabilitation.

The hospital is under the control of the King County Commissioners

Washington Sanatoria



ALDERCREST SANATORIUM SNOHOMISH, WASHINGTON

L. G. WOODFORD, M.D., Medical Director

ALDERCREST is a 57 bed sanatorium located on an ample elevated site eight miles east of Everett Washington. It was opened on March 1st 1918, through the efforts of the Tuberculosis league and with the financial aid and supervision of the County Commissioners.

The institution comprises a surgery an isolation ward for nine children and a workshop donated by the Everett Kiwanis Club. There is modern equipment throughout the sanatorium and it is conducted to pro-

duce the greatest good for the greatest number of county residents.

A competent staff administers adequate rest therapy, proper dietetics, collapse therapy when indicated and educational treatment for pulmonary tuberculosis.

The staff is comprised of the following members: H. L. Eldridge, M.D. Physician, Oscar Proctor, M.D., Surgical Consultant, Miss Marie Sweet, R.N., Superintendent, and Miss Phyllis Plett, Laboratory Technician.



EDGECLIFF SANATORIUM SPOKANE, WASHINGTON

FRANK S. MILLER, M.D., Medical Director

THE Edgecliff Sanatorium an institution for the treatment of tuberculosis, is owned and operated by Spokane County. It is located six miles east of Spokane about two city blocks south of the Apple Way.

The Institution was opened for patients in the spring of 1915 and to date has its 3107th admission. All forms and stages of tuberculosis are accepted for treatment.

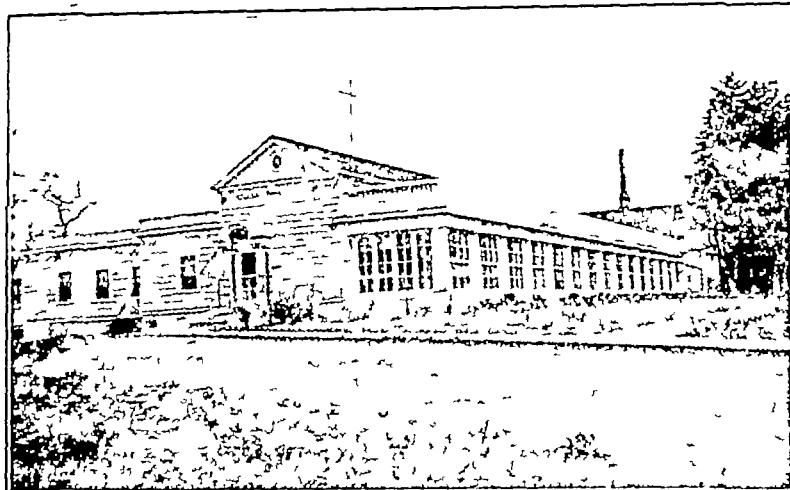
Starting with the Administration Building and Men's and Women's Wards, new buildings have been added as needed—Children's Building in 1917 and Infirmary

in 1919. The Institution will now accommodate 140 patients. Its equipment is complete and up to date.

Any person who has a residence in Spokane County of one year is entitled to care at the Sanatorium regardless of financial condition. Patients from other counties in the state of Washington may be admitted when beds are available. Charges for patients amount to approximately \$80.00 per month, this amount paying actual cost of treatment.

Patients seeking admission should apply to the Medical Director in care of the Sanatorium.

Washington Sanatoria



OAKHURST SANATORIUM

ELMA, WASHINGTON

LESLIE P ANDERSON, M D , Medical Director

OAKHURST Sanatorium was first opened for patients in 1921, by authority of the Board of County Commissioners of Grays Harbor County. The first Board of Managers, appointed by the commissioners were Dr I R Watkins, Aberdeen, Mr R W Craig, Hoquiam, and Mr Eldridge Wheeler, Montesano. This board was re-appointed annually and served continuously, until the death of Mr Eldridge Wheeler, in 1936.

The capacity of the institution, at the time of opening was 25 adult patients. Through the efforts of the Kiwanis Clubs of Grays Harbor County, namely, Aberdeen, Elma, and Hoquiam a Children's Ward wing was added in 1924. A Women's Ward wing, to accommodate 26 patients, was added in 1926. In 1929, the employee's home was built.

At present, the bed capacity is 65, with accommodations for 25 men, 26 women and 14 children.

MOUNTAIN VIEW SANATORIUM

LAKEVIEW WASHINGTON

Ross E McPHAIL, M.D.,
Medical Director



MOUNTAIN View Sanatorium is situated at Lakeview, Washington nine miles from Tacoma, Washington, which is the County seat of Pierce County, Washington. The grounds contain forty acres of natural park consisting of Fir and Oak trees. From the porches and wards there is an unsurpassed view of Mount Tacoma.

The corner-stone was laid May 16 1914, and the first patients admitted January 12, 1915. The present capacity is 110 beds for Adults and a Preventorium of 30 beds. The Sanatorium is under the direct supervision of the Pierce County Commissioners. The institution is fully equipped for Medical and Surgical treatment.

Washington Sanatoria



BLUE MOUNTAIN SANATORIUM

WALLA WALLA, WASHINGTON

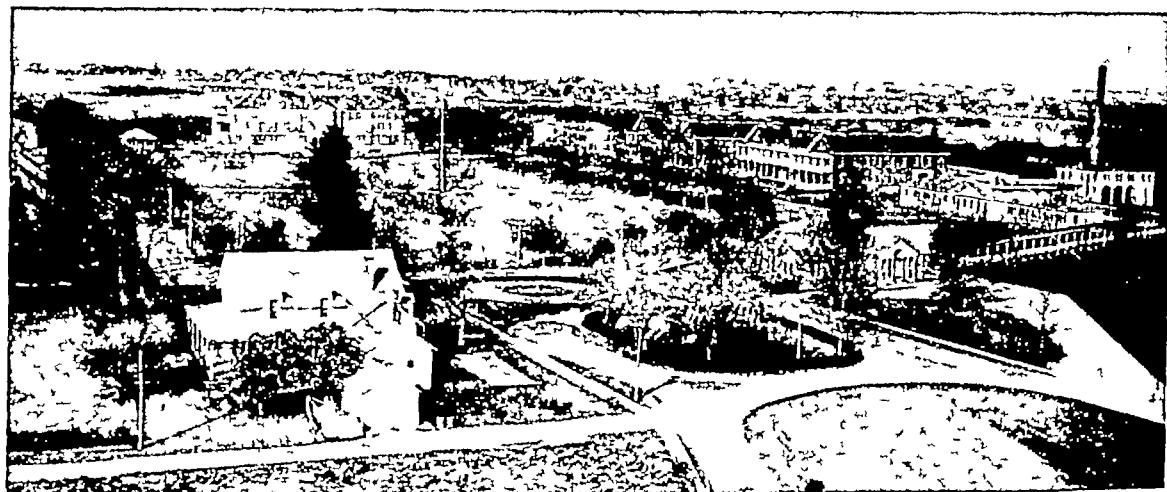
MARIAN GILLESPIE, R.N., Superintendent

THE Blue Mountain Sanatorium was built by PWA funds and the institution was officially opened on May 18th 1935. The sanatorium has 32 beds and is owned and operated by the County of Walla Walla and it receives state aid.

It is situated on a bluff overlooking the Blue Mountains about two and one-half miles from the City of Walla Walla. The sanatorium has a cheerful environment and it commands a beautiful view of the sur-

rounding valley. The flowers and well kept grounds have solicited much praise from patients and visitors to the sanatorium.

Dr R W Smith is employed part time as medical director. Particular attention is given to the diets. The meals are carefully prepared and they are especially planned for each patient. Fresh vegetables and fruits are supplied in abundance.



VETERANS' ADMINISTRATION FACILITY

WALLA WALLA, WASHINGTON

ORVILLE D. WESCOTT, M.D., Manager

THE Veterans Administration Facility at Walla Walla, Washington, is situated to the southwest and adjoining the city limits. The reservation consists of approximately 600 acres of land, and prior to its release by the U S Army to the U S Public Health Service in 1921, it was for many years a Regimental Cavalry Post of the Army.

After remodeling and the construction of several additional wards this former army post was opened as a Tuberculosis Hospital. The gradual decline in the need for beds for tuberculous patients during the past several years, and the need for additional medical and surgical beds, changed the type to a general medical and surgical hospital, with 150 beds reserved for tuberculosis patients, and a total bed capacity of 400.

Three wards are reserved for the tuberculous group classified according to the stage of the disease and the type of treatment required. A modern receiving ward and surgical service building was constructed in 1928, also, a new and up-to-date dietary service with modern equipment, and a recreation building, which provided for library space, a large auditorium with stage for moving pictures and sound equipment, a billiard room, canteen, barber, and tailor shops. The illustration above shows the Administration Building, the ward buildings to the right, and at the far end of the old parade ground the new receiving ward and surgical service building with officers' quarters to the left. The present patient population is approximately 400, with a monthly turn-over of the patient group of from 150 to 175.

Sinusitis With its Complications Simulating Tuberculosis

JOHN E NELSON, M.D. *
Seattle Washington

THE common association of sinusitis and bronchitis has been noted repeatedly in medical literature. But it is not so well known that symptoms arising from these conditions frequently simulate tuberculosis of the lungs. Many patients with sinusitis and its complicating lower respiratory infections are diagnosed and treated as tuberculous. This is due in part to the similarity of symptoms—cough, expectoration, pain in chest, malaise, loss of appetite and weight, fever, and even hemoptysis, and also because in both these conditions symptoms may persist for a long time.

Two French surgeons, Rest and Sergent, made the observation during the World War that soldiers treated for pulmonary tuberculosis were in a great many cases suffering not with tuberculosis, but with bronchitis associated with sinus disease, and when the sinusitis was cleared up the bronchial symptoms disappeared.

It may well be accepted that subacute and chronic bronchitis, pneumonitis, and bronchiectasis are due in most instances to sinusitis, and the clinical picture often presents a tuberculous appearance. In our own experience a number of cases have occurred which have aroused our interest in this matter. In one typical case the patient was tentatively diagnosed tuberculosis and referred to Laurel Beach Sanatorium. Examination failed to reveal tuberculosis but did bring out subacute bronchitis and sinusitis, the correction of which promptly led to recession of symptoms.

In the study of diseases of the respiratory tract, one must appreciate the fact that the upper and lower respiratory areas are but separate sections of one specific system, and that infection in one part usually involves the other. There is an intimate relationship between these two sections through the lymphatic system and through inhalation.

Mullen and Rycer, by extensive animal experimentation established the fact that infection from the paranasal sinuses readily

extends downward toward the bottom of the respiratory tree.

By the use of carbon suspensions and tubercle bacilli emulsions these men proved that lymph drainage of the antrum is by the way of the submaxillary, and deep cervical nodes, then through lymph ducts and great veins to the right side of the heart, and, of course, to the lungs.

They also proved that inhalation leads to the same end. India ink and bacterial suspension injected into the nasal fossa, or into the antrum in such amounts that a good deal escaped into the nasal fossa, were readily inhaled, producing effects in the lungs. Microscopic sections of the lungs revealed carbon and bacilli packed in the alveoli both free and in large mononuclear or in alveolar cells. They then become detached, either to be cast off in the expectoration or taken up and carried along the course of lymphatic absorption.

These men were of the opinion that irrespective of whether the infection spread through the lymphatics or by inhalation, the bronchial and mediastinal glands become involved.

Thus there are two main routes which connect the sinuses with the lower respiratory tract—the lymphatics which can function even when the sinuses are not draining, and inhalation or direct continuity which is open to any infection reaching the nasal fossa from the sinuses or elsewhere.

The principle infections commonly accompanying sinusitis and which may simulate tuberculosis are laryngotracheitis, bronchitis, pneumonitis, and bronchiectasis. A careful examination of the entire respiratory apparatus in patients presenting suggestive symptoms should, in practically all cases, reveal a definite distinction between the tuberculous and the non-tuberculous lesions. It must be borne in mind, of course, a patient may be suffering from both sinusitis and tuberculosis.

In the differential diagnosis of respiratory conditions the physician will be much more

* Medical Director Laurel Beach Sanatorium, Seattle, Washington

accurate in his diagnosis if he has a definite plan to follow such as the four-step outline suggested by the National Tuberculosis Association

1 History—A carefully taken history is of vital importance as it will frequently make the examiner suspicious of an upper respiratory infection being the primary source of trouble. Symptoms frequently seen are repeated headcolds, with stuffiness of the nose and post-nasal drainage. Pain is not always present. It depends upon whether there is an acute or chronic condition with or without obstruction to drainage. The location of pain will depend upon which sinuses are involved. If it is a maxillary, which is most frequently infected, there is often tenderness over the cheek bone and at times over the frontal region. In frontal sinusitis, the pain is usually supraorbital, with acute tenderness in this area. In ethmoidal and sphenoidal infection, the pain is often ocular with a generalized occipital headache. As complicating lower respiratory infection develops there is often pain or soreness in the parasternal regions. Any persistent cold should make the examiner consider a complicating sinusitis. However, a negative history of upper respiratory infection does not preclude the possibility of sinus disease. A chronic sinusitis may often be highly insidious. It may cause no pain. The discharge may be slight, there may be no cough, headache, fever, and yet the patient goes steadily down hill, due to the absorption of toxins from the extensive mucous lining of the para-nasal region. In tuberculosis, while there may be a history of frequent colds, they are not accompanied by localized sinus symptoms. And the pain in the chest is usually unilateral.

An acute sinusitis may result in only slight bronchial disturbance or pneumonitis but as the sinusitis becomes more chronic, purulent or hyperplastic, we frequently see chronic bronchitis becoming established and if the sinusitis is neglected it often results in a bronchiectasis. Therefore a history of upper respiratory infection or of bronchitis, pneumonitis, or bronchiectasis, should make one search for a primary cause, a probable sinusitis. While the history is of vital importance in suggesting the possibility of sinus disease further study is needed to arrive at an accurate diagnosis.

2 Physical Exam—Nose and throat A careful nose and throat examination of every patient should be made where there is a possibility of a respiratory tract infection. If the pharynx reveals an inflammatory area along the posterior pillars or generalized inflammation, or if there are postnasal mucopurulent discharge, engorged turbinates or deformity with obstruction one should be very suspicious of sinusitis.

Transillumination is of vital importance as many suspicious cases can be found by this procedure. A sinus transilluminator should be as much a part of the physician's equipment as the stethoscope. One of the best lamps is the rehostat type with a small pencil shaped bulb which can be placed against the lower eyelid and pressed backward beyond the infra-orbital ridge. The light is directed downward toward the floor of the antrum and the illumination is viewed in the roof of the patient's mouth. The room must be dark and care used in not having the light too bright or very slight cloudiness of an antrum will not be noticed. This method of transillumination of the maxillary sinuses gives better results than the older method of placing the globe inside the mouth and looking for cloudiness on the skin surface.

The finding of changes in a sinus may represent past rather than present disease. On the other hand there may be definite sinus disease without noticeable change on transillumination. While the general practitioner may not be able to diagnose most of his cases of sinusitis, he should be able to screen out the suspicious ones and refer them to the rhinologist for more complete study.

Bronchitis, pneumonitis, and bronchiectasis, the frequent complications of sinusitis, are usually confined to the hilar and basal regions of the lungs and are mostly bilateral. Rales and rhonchi are found mainly in these areas. In tuberculosis the lesion is found in the upper part of the lung in 95 per cent of cases and is usually, until more advanced, unilateral.

3 Laboratory Work—There are two tests of great value in helping to rule out tuberculosis. The Mantoux or tuberculin skin test and the sputum examination. A negative Mantoux up to a 1 mg OT is proof of a non-tuberculous lesion. A positive tuberculin reaction means that the individual has been in-

fected by tubercle bacilli but does not mean he is suffering with tuberculosis. Repeated negative sputum tests for tubercle bacilli in a patient who has coughed and raised sputum for weeks is very strong evidence against tuberculosis. The sedimentation rate will usually be found more rapid in an acute sinusitis than in a minimal tuberculosis.

4 X-ray Study—Sinus films are of great aid in many cases but information derived from them must frequently be correlated with all the data before a definite diagnosis can be made.

Shambough (Practical Medical Series Nose and Throat) states, "In the case of the maxillary sinus, which is by far the most frequently involved, very little is added by the x-ray that is not shown by transillumination. And irrigation of the sinuses, so simple for the rhinologist to carry out, gives more information than either."

In bronchitis the x-ray film of the chest frequently reveals increased hilar shadows with generalized increase in peribronchial markings extending out from each hilum, more pronounced in the bases, with no parenchymatous involvement. Pneumonitis, or bronchopneumonia, is characterized by peribronchial infiltrations clustering about branches of the middle and especially the lower lobe bronchi. These infiltrations are multiple foci of infection resulting from organisms penetrating the bronchial wall. These areas of pneumonitis may remain small and soft in appearance, showing feathery edges, or they may coalesce to form irregular areas of consolidation. Disease may be more pronounced on one side than the other, but there is always some degree of bilateral involvement.

In tuberculosis, considerable variation in shadows is seen. However, one may accept it as a rule that infiltrations in the apical and infraclavicular regions are tuberculous, especially if they are small, nodular and occur in groups. Minimal tuberculosis is usual-

ly unilateral. If the lymph glands are enlarged it is on the side of the mottling and usually there is some fibrosis between the distal focus and enlarged glands. One of the greatest aids to differential diagnosis is the fact that shadows produced by bronchitis and pneumonitis are more transient and variable than those produced by tuberculosis. Those of tuberculosis are more constant. Serial films to detect these changes are of greatest importance.

No doubt many cases of sinusitis with its complications may be correctly diagnosed by the use of only one or two parts of the presented outline. However, one encounters difficult cases that require not only the entire examination but prolonged study and observation before it is possible to determine whether one is dealing with a sinusitis and its complications or with tuberculosis.

Summary

1 Sinusitis together with its complicating infection of the lower respiratory tract frequently simulates tuberculosis of the lungs.

2 The upper and lower respiratory tracts are simply separate parts closely united by lymphatic system and by inhalation into one specific organ.

3 The paranasal sinuses in their strategic position at the head of this respiratory mechanism are the key to the transmission of many of the non-tuberculous infectious diseases to which the respiratory system is subject.

4 In the diagnosis of diseases of the respiratory tract there should be close cooperation between the physician in charge of the case and the nose and throat specialist.

5 As an aid in the differential diagnosis of respiratory disturbances a definite outline of procedure is advisable, such as History, Physical Examination, Laboratory Work, and X-ray Study. Such a plan leads to far more satisfactory results.

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The Determination of Activity of Small Tuberculous Pulmonary Lesions

BYRON F. FRANCIS, M.D.*
Seattle, Washington

MODERN methods of tuberculosis case finding involve the routine roentgenological examination of large groups of the population. The percentage of active cases so found varies with the type of group studied from 0.1 per cent in young children to 9.0 per cent in adult contacts¹. The medical literature of the last seven years indicates that the method can be very effective and that it will likely be used more widely. It is especially valuable in bringing to light many small lesions.

Such campaigns are valuable only insofar as the activity of each newly found lesion is accurately determined and the patient properly managed from then on. Here the general practitioner plays an important role. In some places, notably Detroit², he takes a part in the case finding itself, but everywhere he is called upon to advise and care for patients so found. The apparently normal individual who, by the mere accident of being included in a group examination, is informed that he has tuberculosis will naturally go at once to his family physician for an interpretation of the findings.

It is obvious, therefore, that the general practitioner must understand the potentialities of these unsuspected lesions in order to give wise counsel.

The majority of the cases so found are in a minimal stage^{3, 4}, and a high percentage are asymptomatic. Further study shows many of these to be active, nevertheless. This is in marked contrast to the condition in most sanatoria where only a small percentage of patients are in the minimal stage and a much larger percentage advanced. Those with minimal lesions usually manifest few or no symptoms and were probably diagnosed following some routine examination. Of the advanced cases, nearly all have symptoms, indeed it was the awareness of symptoms which led these people to consult a doctor.

It must be emphasized that not all cases of tuberculosis found in roentgenological sur-

veys are in a minimal stage. Some are advanced and even associated with severe symptoms for which the patient had not sought relief. Other advanced cases, however, produce no symptoms or not enough to suggest to the individual that he should seek medical advice.

When confronted with roentgenological evidence of a pulmonary tuberculous lesion, the immediate problem is to determine whether or not it is active. When symptoms are present, there is no doubt, but when even the most searching history fails to elicit symptoms, it is often very difficult.

The acceptance of the fact that active tuberculosis may be present without symptoms is fortunately increasing. Too frequently, however, physicians are lulled into a false sense of security by the apparent good health of an individual. Most of us were taught that active tuberculosis was always accompanied by certain symptoms, when these were not present, neither was active tuberculosis. Maurice Fishberg, in the fourth edition of his book "Pulmonary Tuberculosis" (p. 229), says, "there is no active phthisis without constitutional symptoms." He stressed the point by repetition within the chapter. In spite of his emphasis on the statement there is sufficient evidence available now to render his statements definitely misguiding.

It is possible that if our methods were sufficiently refined we could detect constitutional reactions associated with activity of any pulmonary lesion. But if we were to depend only upon the presence of the constitutional symptoms enumerated by Fishberg before diagnosing activity we would frequently permit our patient's tuberculosis to spread undetected. We are beginning to realize now that the symptoms and signs, "fever, cough, tachycardia, languor, night sweats, hemoptysis, etc." (Fishberg, p. 225) are often relatively crude tests of bodily dysfunction. If these symptoms are marked the disease is almost always beyond the minimal stage. Patients often allow these symptoms to persist for long periods before seeking medical advice.

* Medical Director, Riverton Sanatorium, Seattle, Washington.

From a practical standpoint, therefore, these symptoms are useless for early diagnosis of the disease and their absence does not indicate absence of activity.

A careful recording of the temperature over a variable observation period should be made. If fever is demonstrated it has significance, but if no abnormal reaction is found, one is still not justified in making a diagnosis of no activity.

The known sensitive indicators of tissue change such as serial differential white blood counts of the Schilling and Arneth varieties, and the blood sedimentation rate determinations will often give evidences of activity without any kind of subjective manifestations or abnormal temperature reaction. Bredeck⁵ has used careful Schilling blood differential counts before and after injections of tuberculin and believes that by this means he can differentiate active from inactive lesions. This method deserves further use.

In early tuberculosis physical examination often reveals no abnormality. This fact has been well established^{6, 7}. If the moist, bubbling, fine, or medium type of rale is present an active lesion may usually be inferred. Certain other types of rales, notably the so-called dry or crackling variety may be present for years over the site of inactive lesions. The absence of abnormal physical signs has no value at all in ruling out either the presence of activity or a lesion itself.

When sputum is produced as a consequence of a tuberculous lesion the disease has often progressed beyond the minimal stage and excavation has occurred. Furthermore, as Pinner and Werner⁸ have shown such sputum will nearly always be found positive for acid fast bacilli if examinations are made properly. A positive sputum means activity, at least in the sense that the patient requires further observation and treatment. All too frequently sputum examination is neglected although it is one of the simplest laboratory procedures. On the other hand, to wait for a positive sputum before diagnosing either the presence of tuberculosis or activity is to wait for a lesion to progress beyond the early stage.

The roentgenographic method is not only a highly accurate means of finding tuberculosis, but when properly used is also a sen-

sitive indicator of activity. In many instances it is possible to make a definite diagnosis of activity on the appearance of the initial film. Irregular, cotton-like, blotchy shadows, frequently characterized as "soft" are good evidences of an active lesion. In the author's experience, it is justifiable to recommend bed rest for such patients even though there is no other evidence of activity.

In other instances, where the initial film is not so definitely indicative of the state of activity, further observation is required. Serial roentgenograms may reveal a change in the size or density of the lesion which is evidence of activity. A spreading lesion requires prompt treatment, bed rest, and probably some type of collapse therapy, regardless of how well the patient may feel. Films made at intervals of a month or two may reveal an increase in the size of the involved area, even to the production of a cavity, without at any time showing any constitutional reaction.

In some individuals, especially older adults—graduate students most often in the author's experience, the history will reveal a past record of tuberculosis during which roentgenograms were made. Whenever possible these should be consulted in order to get an idea of the original appearance of the lesion and especially to compare with the most recent film. Any change during the interval is significant.

A retrogressing lesion is evidence of a labile tuberculous process. It is a matter of experience that it is not infrequently accompanied by a spread in another area of the lung. Curiously, the diminishing lesion itself sometimes reverses its process and suddenly spreads. Although retrogression will not be accompanied by an abnormal temperature curve, sedimentation rate or blood picture, the patient must have the same observation and control as a patient with a spreading lesion or symptoms. Some of these points are illustrated by figures 1 and 2.

The fact that in most instances active tuberculosis or a rapidly spreading lesion is accompanied by systemic reactions does not invalidate what has been said above. It is well known also that constitutional symptoms such as fever may be present for long periods as evidence of activity without being accompanied by x-ray changes. It behoves the

physician to remember that very often these lesions have a long period of latency. After months or even years they may begin to spread or show changes although in the meantime there had been no constitutional reactions or x-ray changes.

As McPhedran⁹ pointed out, in actual practice the only type of tuberculous lesion which may be considered healed is the sharp dense strands which remain stable for years under competent roentgenographic control. Any other patient should be kept under observation with frequent roentgenograms for many years. Above all, he should not be dismissed from all observation because he appears perfectly healthy at the time. One must remember that if he should return with symptoms at a later date, the disease will very likely be in an advanced stage.

It should be pointed out that in order to detect the minute changes which are so important in this work the best possible roentgenographic technique is essential. The films must be read by a trained observer. Furthermore, since periodic observation over a period of years is necessary arrangements should be made for storing films for reference purposes as long as the patient lives. All too

often one finds that a definite determination of a patient's tuberculosis is prevented or at least long delayed because earlier x-rays of his chest have been destroyed. On the other hand what a satisfaction it is to compare recent films of a patient with those made months or years previously, and to find no change.

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A. 11-17-32 (Fig. 1) B 5-3-33



A. 1-11-33



(Fig. 2)



B 10-31-33

Legend

Fig. 1. K. S., medical student, age 21 years, A. 11-17-32, found by routine roentgenography. No symptoms. Shows soft lesion in periphery of left first anterior interspace (a) and scattered soft mottling in mid-lung area (b). On 5-3-33 (B) the shadows noted at (a) and (b) have largely disappeared but a new "soft" lesion containing a cavity has appeared at (c). At this stage and during the intervening period there were no symptoms although he carried on his school work but with some limitation of activities. Shortly afterwards he went to a sanatorium positive sputum developed later but he was discharged in 1936 with a few hard string-like shadows as only residuals of previous lesions.

Legend

Fig. 2. L. W., male laboratory technician, age 23. A. 1-11-33, found on routine roentgenography of employees, shows small lesion, not definitely active—appearing in right 2nd anterior interspace. Symptoms were not present but patient urged to have frequent examinations. Next seen 10-31-33 (B), this time with symptoms and new, diffuse wide area of infiltration in the opposite axilla. But now first lesion (small arrow) is much smaller and more string-like.

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